

The Institute of Agricultural Economics
of the Christian-Albrechts-Universität Kiel

**Voting vs. Non-Voting and its Impact on
Developing Countries:
Empirical Application of Latent Class Models and
Nested Multinomial Logit Models**

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1. Chapter

Introduction and Summary

1.1. Introduction

During the Twenty Third Ordinary Session of the African Union Assembly of 2014 in Malabo, Equatorial Guinea, the Heads of State and Government adopted a set of agricultural goals to be attained by 2025. This agreement is known as the Malabo Declaration on Accelerated Agricultural Growth and transformation for Shared Prosperity and Improved Livelihoods. The declaration is a re-commitment to the goals of the Comprehensive Africa Agriculture Development Programme (CAADP). The goals include ending hunger, tripling intra-African trade in agricultural goods and services, enhancing resilience of livelihoods and production systems, and ensuring that agriculture contributes significantly to poverty reduction. Among the developing countries facing problems of poverty and undernourishment are Senegal and Uganda, which are also committed to the Malabo Declaration.

Governmental policy plays a key role in the processes of achieving food security, reducing poverty and promoting economic growth. In this sense, the quality of governance is of paramount importance to ensure that the policy making process responds to the needs of people. Furthermore, in political theory, electoral competition is considered a democratic mechanism to guarantee good government performance. In reality, however, electoral competition often leads to policy failure. Even though governments have the authority to design and apply efficient policies, they need to devote a significant effort to do so. This effort can be boosted only by incentives or motivations that come from the people. This means that people, through their vote, have the power to either reward a good performance of the government, by reelecting them, or to punish a badly performance by electing a new government. In political practice, it is a common observation that the development of policies is not only inefficient, but also biased in favor of special interests. These distorted policies are explained by two major problems of low political performance: Government Capture (where more consideration is given to the political interests of a minority group at the expense of the majority, because there is no representativeness of society) and low Government Accountability (where the government lacks incentives to implement efficient policies, because they are not being controlled).

In this thesis, we empirically analyze voter behavior, government performance, the importance of abstainers in the policy making process, as well as, the impact of information signals regarding the performance of the incumbent. Serious scholarly attention has been given to the study of voter behavior, for example Downs (1957), Campbell et al. (1960), Lazarsfeld et al. (1968) and Lipset and Rokkan (1967) are among the main authors addressing this issue. Other important amount of research have been devoted to the analysis of government performance, for instance Bailey (1999) and Stevens (2005). There is also a few amount of research studies combining both topics such as, Henning et al. (2014) and Seide (2014), as well as, Keefer and Khemani (2005) and Bardhan and Mookherjee (2002), who argue that less electoral competition implies incentives for the government to implement policies that do not correspond to the needs and desires of the majority in the society. As regards the aspects of abstention/participation, their inclusion in voter behavior study is not quite common. Downs (1957) explained that citizens choose the party they believe will provide them a higher utility. However, if the party differential is equal to zero, they will abstain. Later, Riker and Ordeshook (1973) conceptualized the citizen's choice as a two-stage process, where the voter first identifies a preferred candidate and then decides to vote or abstain. Further, Thurner and Eymann (2000) proposed a model where they consider the simultaneous choice among parties and the option abstention. In addition, just some authors have focused their research on the importance of information for voting decisions. Grossman and Helpman (1996), for example, affirm that voters have both, policy-oriented and non-policy oriented voting motives. From their perspective, the relative importance of these voting motives depends on the level of information that voters have about politics. To elaborate further, if voters have limited information on politics by the time of casting a vote, they are likely to base their decision on non-policy-issues, such as charisma or religion, giving less consideration to government policy positions. This behavior in turn, reduces the incentives for the government to implement efficient policies. Other authors also highlight the importance of information when it comes to make electoral choices. For instance, DellaVigna and Kaplan (2006) studied the impact of media bias upon voting, finding a significant effect of exposure to news on voting decision. Such exposure induced a substantial percentage of the viewers to change their decision. Pande (2011) in turn, explained that limited information is an explanation for low-quality politicians in low-income democracies. Therefore, information about the political process and politician performance improves electoral accountability. According

to Coate (2004), voters update their beliefs rationally given the information they have received from advertising campaigns. Furthermore, Banerjee et al. (2011) found evidence that voters change quite substantially their electoral choice when they are given information about government performance and qualifications of the incumbent. They pointed out the fact that voters demonstrated sophistication using the information to judge performance and qualifications, as oppose to the fear that information would simply confuse them.

In general, this thesis responds empirically to the following questions:

- How does voter behavior impact the performance of the government?
- Could abstainers influence the policy making process?
- Could an information signal regarding the performance of the incumbent change voter behavior? And do these changes in voter behavior affect government performance?

To answer these questions empirical analyses were carried out using data from Uganda, Senegal and Honduras. For Uganda we used a voter survey including questions on socio-demographic characteristics, voting behavior, policy positions and network characteristics designed by Seide (2014) and applied in June 2013 in collaboration with Wilsken Agencies Ltd. Likewise, for Senegal we designed two rounds of voter surveys including the same type of questions of Uganda's survey. The first and second round of interviews were applied in Senegal on the same day in January 2019 by the Senegalese Agricultural Research Institute. In the case of Honduras, two sources of data were collected. Firstly, detailed data regarding the socio-economic and demographic characteristics of the households was collected by IFPRI (International Food Policy Research Institute). Secondly, a voter survey was designed to look at beliefs and political preferences of households. The data was collected by O&M Estudios y Proyectos just before the general elections on November 2017.

With the collected data we proceeded to estimate probabilistic voter models to understand why voters choose the way they do. More specifically, we estimated Latent Class models and Nested Multinomial Logit models considering three voting motives: Policy, Non-Policy and Retrospective. Additionally, the alternative Abstention was included. Then, with the results obtained we calculated marginal effects and relative marginal effects for the three voting components that allowed us to measure the performance of the

government. Furthermore, based on the first (FOC) and second order condition (SOC), Local Nash Equilibrium were found for different policy issues.

This research study has three main contributions. Firstly, the inclusion of the alternative Abstention in all estimations to determine the importance of non-voters in the policy making process. Secondly, the empirical analysis of changes in voter behavior as a result of an information signal about the performance of the government and how these changes influence the incumbent's performance. Finally, the analysis of the Local Nash Equilibrium that defines the optimal policy position of the incumbent, where their probability of winning the electoral process is maximized.

1.2. Summary

1.2.1. The Importance of Policy vs. Non-Policy Voting in Presidential Elections in Uganda: A Latent Class Approach

In democratic systems, elections should reflect the interests of the whole society and serve to control the government. In reality, however, electoral competition often leads to policy failure due to Government Capture and low Government Accountability. An understanding of both phenomena has to be based on voter theory and, nowadays, the probabilistic voter model is the workhorse model applied in voter studies. Some researchers have combined the analysis of voting behavior and government performance (Keefer and Khemani (2005) and Bardhan and Mookherjee (2002)). Other studies argue that voters apply different mechanisms to evaluate electoral candidates or parties, such as, Downs (1957) and Grossman and Helpman (1996). Concerning the country under study, the findings of Seide (2014), indicate that voting behavior in Uganda is predominantly oriented by non-policy motives. However, given the considerable level of abstention registered in the short history of Uganda's democracy, we included Abstention as an alternative in our choice set, to evaluate the importance of policy vs. non-policy motives in the voters' decision making process.

To carry out our analysis, we used data from a voter survey including questions on socio-demographic characteristics, voting behavior and policy positions designed by Seide (2014). Furthermore, we derived a theoretical model to estimate voter behavior including the two voting motives: non-policy oriented and policy oriented. Subsequently, we estimated latent

class models to allow heterogeneity and calculated marginal effects and relative marginal effects (RME) to assess the importance of each voting motive. Moreover, government performance indicators were estimated.

Our results showed two classes of voters: class 1, mainly represented by those usually marginalized and class 2 that gathered their counterparts. Concerning the estimated mean probabilities, the ruling party NRM turned out to be the winner with a considerable difference. According to the RME, the non-policy component is the most important. The estimated government performance indicators suggest that the political process is biased in Uganda, the government is not accountable towards the voters and elections do not provide an effective mechanism to promote democracy. Nonetheless, non-NRM supporters have a higher accountability index than those backing up NRM. The former group also has a higher political weight and captures the latter, and therefore, they should be considered in the policy-making process, as they might incentive the government to implement efficient policies. Finally, we conclude that, if most of the people who abstain decided to cast a vote, the electoral outcome could change in favor of the opposition party FDC.

1.2.2. Do Ethnicity and Gender Influence Government Performance in Uganda?: Empirical Estimations with Latent Class Models

The concept of inequality often refers to differences in income, but it also entails aspects of identity such as gender and ethnicity. In Uganda, women and ethnic minorities are marginalized in terms of access to good education, high-paying jobs and land rights, among others. Many researchers have addressed the discrimination against women in Uganda, such as, Atekyereza (2001), Kasirye and Kasirye (2011) and Pedersen et al. (2012). On the other hand, only few papers have been written about discrimination against ethnic minorities, for example the research of Moradi and Baten (2005). Furthermore, authors like Tripp (1994), Singiza and Visser (2015) and Wordofa (2004) have evaluated the role of disadvantaged groups in politics. Even though electoral competition should guarantee high government performance, it often leads to policy failure if voters are not policy oriented when it comes to make their voting decision. In the case of the aforementioned Uganda's marginalized groups, this might be intensified due to their limited access to education. Thus, the government could neither have incentives to consider them in the policy making progress, nor to implement efficient policies.

The data used in this empirical research corresponds to a survey designed by Seide (2014) containing questions on socio-demographic characteristics, voting behavior and policy positions. In our study we estimated latent class models including the alternative Abstention to see if the variables related to ethnicity and gender influence voting behavior in Uganda. To evaluate the importance of the voting components, marginal effects and relative marginal effects (RME) were calculated. Also, indices for accountability and capture were estimated to assess if the government lacks incentives to develop and implement efficient, as well as, unbiased policies.

Furthermore, with the latent class analysis we identified two classes of voters based on their gender and ethnic background. Our results demonstrate that the ruling party NRM was the winner with a remarkable advantage. Concerning the RME, women in general choose more non-policy oriented than men. However, when looking at their education level, it is worth noting that educated women choose more policy oriented than the uneducated. Thus, if the level of education of women in Uganda increases, they might incentivize the government to apply better policies. On the other hand, the ethnic group Lugbara, in spite of not being among the biggest ethnicities in Uganda, could motivate the incumbent to implement more efficient policies because it chooses more policy oriented compared to other ethnic groups. Nonetheless, Musoga ethnicity captures Lugbara as it has a higher political weight and therefore, it could exercise more influence in the policy-making process.

1.2.3. Changes in Voter Behavior after an Information Signal: An Experimental Approach for Senegal

In political theory, electoral competition is considered a control mechanism, as voters have the power to either punish the bad performance of the government or reward the good one through their vote. However, in real life, electoral processes often lead to a distorted policy implementation due to Government Capture and low Government Accountability. Grossman and Helpman (1996) affirm that the relative importance of voting motives depends on the level of information that voters have about politics. Other authors, like Coate (2004) and Banerjee et al. (2011), also highlight the importance of information when it comes to make electoral choices.

We conducted a political experiment where an information signal is delivered to different groups of voters. Then, based on voter survey data collected before and after this

information signal, changes in voter behavior were measured by means of probabilistic voter models with latent class. We were also interested in measuring the changes in the relative importance of the three voting motives (policy, retrospective and non-policy).

With the optimal models, probabilities were calculated for each alternative, type of treatment and round. Although there were changes between rounds, the impact on party choice was not very strong. As expected, after the information signal, the relative importance of the three voting components changed significantly. Even though, we expected that the more informed voters are, the more policy oriented they would choose, in most cases, the importance of the non-policy voting motive increased, resulting in lower government accountability indices. Our findings suggest that the behavior of voters can be influenced or changed by means of information signals. However, since a clear treatment effect was not observed, future additional research is needed using a bigger sample size.

1.2.4. Voting vs. Non-Voting in Senegal: A Nested Multinomial Logit Model

Approach

Elections are considered a vital principle of democracy as they should ensure that efficient policies are implemented by the government. However, governments usually apply inefficient policies due to problems of government performance. Additionally, even though the political participation is a constitutional right, it is clear that not all people take part in electoral processes. Scholarly attention has been given to the study of voter behavior and government performance, for example Downs (1957), Bailey (1999) and Bardhan and Mookherjee (2002). However, little attention has been given to the role of non-voting on voter behavior analysis. Thurner and Eymann (2000) contributed with their study by combining the spatial models of candidate/party choice with abstention/participation choice. In this regard, we were looking to evaluate the importance of abstainers in the policy making process in Senegal.

For the purpose of this research study, we designed a voter survey that was carried out in Senegal just before the presidential elections of 2019. Then, to assess the influencing factors, both in voting behavior in Senegal and in the decision to abstain, we developed nested multinomial logit models including the alternative Abstention. Also, the calculation of marginal effects and relative marginal effects (RME) for each voting motive was necessary to evaluate the performance of the government. In addition, to verify if elec-

toral competition in Senegal encourages the incumbent to perform efficiently, indices of accountability and capture were estimated. Through the derivation of first and second order conditions (FOC and SOC), we also intended to identify the equilibrium policy positions where the party in power has no incentives to move away from.

Our results suggest that different policy, non-policy and retrospective variables are important for voters when making an electoral decision. The estimations also point at the ruling party BBY as the winner and show that most people have a tendency to make their decision more non-policy oriented. Nonetheless, the group of abstainers tend to choose more retrospectively oriented compared to those who decided to participate in the elections. This implies that the former has a higher accountability index and thus, hold the government more accountable. Abstainers also have a higher political weight for the government party and therefore, capture people who cast a vote. This means, that from a perspective looking to the Senegalese society's welfare, they could incentive the government to choose and implement more efficient policies if they decided to participate in the elections. As regards the non-policy component, we observed that abstainers usually do not feel close to any party. Furthermore, a large share of people stating their intention to vote, do not have Party Identification (*PI*) and, in general, people tend to lie about their intended vote choice. Therefore, we might assume that most people with no *PI* who said that would vote for BBY, actually decided to abstain or vote for an opposition party. Thus, should the main opposition parties form a coalition, their probability of winning the elections is higher, as long as, abstainers decided to vote. Finally, after estimating the FOC and SOC, we noted that the main opposition parties are perceived to be closer to the optimal policy positions than the ruling party, which gives an incentive to the incumbent to change its policy positions as policy-oriented voters might choose an opposition party instead.

1.2.5. How Important Are Abstainers in Presidential Elections?: A Comparative Analysis between Africa and Latin America

To reduce poverty and undernutrition and increase economic growth in a country, the quality of governance is important. Electoral competition should promote a high performance of the incumbent. However, even in countries with well functioning democracies, not all people with the right to vote in a presidential election decide to cast a vote. Ac-

According to Solijonov (2016), even though the voter population has been growing globally and the number of countries that hold elections have increased, the global average voter turnout has decreased significantly over the past decades. This statement corresponds to the situation of Senegal and Honduras, where there has been a decline in the voter turnout during the past years. In this sense, the purpose of this research study is to evaluate the importance of abstainers in the policy making process in Africa and Latin America.

To this end, detailed data regarding the socio-demographic characteristics, as well as, beliefs and policy preferences of households was collected in Senegal and Honduras. Furthermore, we estimated nested multinomial logit models including the alternative Abstention. Then, to evaluate government performance, we derived indicators for accountability and capture. Also, to determine the optimal policy positions for the governmental parties, First Order Condition (FOC) and Second Order Condition (SOC) were estimated for different issues.

The estimations point at the ruling party of each country as the winner. We also found that, overall, voters with higher tendency to abstain are mostly young and employed people. Similarly, less informed voters are less motivated to participate in electoral processes. The evidence shows that most people have a tendency to make their decision more non-policy oriented. However, it is worth noting that non-voters tend to choose more policy and non-policy oriented than those who voted for the incumbent parties respectively. Further, despite the fact that the accountability indices are quite low in both countries, those who do not support the ruling party hold the government more accountable. Also, abstainers and non-government voters capture those who decided to support the parties in power. The next stage in our study was to identify the optimal policy positions, where the governments maximize their probability of winning. Here, we observed that, in most cases, the main opposition parties are perceived to be closer to the optimal policy positions than the parties in power. This might be an advantage for the opposition parties as they could increase their probabilities of winning the elections, if abstainers decided to participate in the electoral processes. We concluded that, in these two developing countries, one of the factors that voters take into account when they decide to either vote or abstain, is their level of satisfaction with the performance of the president. Finally, we could argue that abstainers, as well as, those who have chosen an opposition party/candidate can motivate the incumbent to choose the policies that better match the specific country needs in order to reduce poverty and undernutrition and promote economic growth.

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2. Chapter

The Importance of Policy vs. Non-Policy Voting in Presidential Elections in Uganda: A Latent Class Approach

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Abstract

Electoral competition is a democratic mechanism to guarantee high governmental performance. In reality, however, it often leads to policy failure due to Government Capture and Government Accountability. An understanding of both phenomena has to be based on voter theory and nowadays the probabilistic voter model is the workhorse model applied in voter studies. In this paper, we first proceeded to derive a theoretical model to estimate voter behavior including two voting motives: non-policy oriented and policy oriented. Subsequently, we tested our theory estimating probabilistic voter models for Uganda including Abstention as an alternative and using an existing election survey data. More specifically, we estimated latent class models to allow heterogeneity. Using the results of these estimations, we found that the ruling party NRM has the highest probability of winning the election. Then we proceeded to calculate marginal effects and relative marginal effects of each voting motive. Our findings indicate that the non-policy component is the most relevant and, in general, voters and non-voters tend to decide more non-policy oriented. The estimated government performance indicators suggest that the political process is biased in Uganda, the government is not accountable towards the voters and elections do not provide an effective mechanism to promote democracy. Nonetheless, non-NRM supporters have a higher accountability index than those backing up NRM. The former group also has a higher political weight and captures the latter, and therefore, they should be considered in the policy-making process, as they might incentive the government to implement efficient policies. Additionally, according to our results, if most of the people who abstain decided to cast a vote, the final electoral outcome could change in favor of the opposition party FDC.

2.1. Introduction

There is a general agreement that governmental policy plays a key role in the processes of reducing poverty and undernutrition and promoting economic growth. The quality of governance is important to guarantee an effective implementation of the best available practice policies. Furthermore, in political theory, electoral competition is understood as a fundamental democratic mechanism to guarantee high governmental performance. In democratic systems elections should reflect the interests of the whole society and serve to control the government. In reality, however, electoral competition often leads to policy

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failure. This is because, in political practice, it is a common observation that the development of policies is not only inefficient, but also biased in favor of special interests. These distorted policies are explained by two major problems of low political performance: Government Capture (where more consideration is given to the political interests of a minority group at the expense of the majority, because there is no representativeness of society) and Government Accountability (where the government lacks incentives to implement efficient policies, because they are not being controlled). However, since it is also broadly accepted in political economy theory that policy choices of democratically elected politicians are driven by their vote maximizing probabilities, an understanding of both phenomena, biased and inefficient policies, has to be based on voter theory. Nowadays the probabilistic voter model is the workhorse model applied in voter studies.

There is a broad range of literature concerning voting behavior on the one hand and government performance on the other. Prominent examples of the former are Campbell et al. (1960) and Lazarsfeld et al. (1968). Important contributions for the latter are among others from Bailey (1999), who addresses different topics regarding local government, and Stevens (2005), who assess the performance of local authorities in terms of the efficiency with which they provide services. However, fewer researchers have combined the analysis of voting behavior and government performance. For example, according to Keefer and Khemani (2005) and Bardhan and Mookherjee (2002), less electoral competition implies incentives for the government to implement policies that do not correspond to the needs and desires of the majority of society.

Additionally, some studies argue that voters apply different mechanisms to evaluate electoral candidates or parties. For example, the classical theory of Downs (1957) assumes that voters evaluate candidates based on their announced party platforms (i.e. policy oriented). On the other hand, some other research studies suggest that voters choose based on non-policy factors. Magee et al. (1989) and Potters et al. (1997) for instance, assumed that campaign spending has a direct effect on voting behavior. Likewise, Austen-Smith (1987) and Baron (1994) found that candidates benefit interest groups and use campaign contributions to influence voters. However, following the theoretical model of Grossman and Helpman (1996) voters base their electoral decision on policy oriented motives, like candidates' policy positions and non-policy oriented motives, such as, candidates' appearance or ethnicity, according to their level of information on politics. In consequence, the higher the importance of non-policy oriented versus policy oriented voter behavior the

lower is the incentive of a government seeking for reelection to implement policies that benefit its electorate.

Concerning the country under study, the findings of Seide (2014), indicate that voting behavior in Uganda, like in many developing countries is predominantly oriented by non-policy motives. Furthermore, electoral campaign acts as a non-policy influence for voters in their decision making process. As pointed by Helle and Rakner (2013), in Uganda the current president Museveni heavily relied on the incumbent advantage in the presidential election of 2011, as he used public resources to finance his electoral campaign. Additionally, it is worth mentioning the considerable percentage of abstention registered in the electoral processes carried out in the short history of Uganda's democracy. Therefore, we considered interesting the inclusion of Abstention as an alternative in our choice set.

The structure of this paper is as follows: In the first part we developed a theoretical model to estimate voter behavior including the two voting motives: non-policy oriented and policy oriented. In the second part the data and variables used for the analysis are described. Then we show the results of the latent class model estimations for the two best models. Finally, we present a summary and our conclusions.

2.2. Methodology

2.2.1. Voter Behavior

There have been several approaches to explain voter behavior. Among the most relevant is the theory of rational voting (Downs, 1957) which assumes that voters and candidates/political parties will make the choice that maximizes their utility and expected vote share respectively. However, as Thurner and Eymann (2000) pointed out, the aspects of abstention/participation have been neglected even though it is clear that not all voters decide to cast a vote in electoral processes. Therefore, in order to also analyze the voters' decision to refrain from participating, the whole set of alternatives must include the option Abstention.

In this sense, if voter behavior is modeled taking into account the rational choice approach, researchers differentiate between a deterministic and a probabilistic voter model. In the deterministic voter model the choice depends on the alternative differential $V_{iA} - V_{iB}$, where V_{iA} and V_{iB} are the utilities that voter i associates with alternatives A and B respectively. In empirical research, however, it is not possible to observe and control all

the factors involved in the decision process. Therefore, it is more suitable to estimate a probabilistic voter model that makes possible the inclusion, in the utility function, of an individual-specific stochastic component μ_{ik} containing these unknown factors.

$$P_{iA}(A, B) = \text{Prob}(U_{iA} \geq U_{iB}) \text{ where } U_{ik} = V_{ik} + \mu_{ik}, k = A, B \quad (2.1)$$

Probabilistic voter models are estimated with Discrete Choice models, since they explain choices between two or more alternatives. Hence, in the context of voter behavior, discrete choice models are exceptionally suitable, as researchers are more interested in the way results were achieved rather than the actual results. Furthermore, in an election, the set of alternatives satisfies all three requirements, i.e. voters choose a party unless they decide to abstain (*collectively exhaustive*), each voter is allowed to either choose only one party/candidate or to abstain (*mutually exclusive*) and there is only a *finite number of alternatives* (all parties and abstention).

In order to derive the Discrete Choice model, it is common to apply a Random Utility Maximization (RUM) model. Here, the voter i chooses alternative k only if this alternative provides him the highest utility U_{ik} . In other words, the greater the utility of an alternative, the more likely is that the voter will choose it.

As previously mentioned, the utility U_{ik} is divided into the part that is known by the researcher V_{ik} and the random unknown part μ_{ik} . We assume that the latter is independent and identically distributed (iid) and follow the Gumbel distribution (extreme value distribution Type I), i.e. μ_{iA} is not related to μ_{iB} and extreme values are allowed. Therefore, a logit model was derived. This model can be extended to a set with multiple alternatives, meaning that voters can choose an alternative k from a set of alternatives K . In this sense, the logit probability model can be derived as (McFadden, 1974)

$$P_{ik}(K) = \frac{e^{V_{ik}}}{\sum_{k=1}^K e^{V_{ik}}} \quad (2.2)$$

Depending on the kind of variables and parameters that are included, there are different logit models. A multinomial logit model consists of individual specific variables, like age, gender and education, with alternative specific coefficients. On the other hand, a conditional logit model contains alternative specific variables, such as issue distances, with generic coefficients. Since this study included both kinds of variables, a mixture of

multinomial logit and conditional logit model was estimated.

A simple form of the model looks as follows:

$$P_{ik}(K) = \frac{e^{V_{ik}}}{\sum_{k=1}^K e^{V_{ik}}} \text{ where } V_{ik} = \alpha_k + \beta x_{ik} + \delta_k r_i \quad (2.3)$$

where α_k is an alternative specific constant, x_{ik} is a vector of alternative specific variables with a generic coefficient β , and r_i is an individual specific variable with an alternative specific coefficient δ_k . The alternative specific coefficients are estimated with one of them set to zero and the remaining coefficients are interpreted with respect to the alternative whose coefficient was set to zero. On the contrary, generic coefficients are constant for all alternatives.

The models estimated in this paper included two components or voting motives: non-policy oriented (V_{ik}^{NP}) and policy oriented (V_{ik}^P). The voter's utility function is now as follows:

$$V_{ik} = V_{ik}^{NP} + V_{ik}^P \quad (2.4)$$

Not all voters are well informed and aware of policies, especially in developing countries. Therefore, voters might apply non-policy indicators to estimate their expected utility, such as their socio-demographic characteristics x_{ij} , as well as, their approval of the incumbent's work y_{ig} . Other indicators correspond to the concept of valence (Schofield, 2007), which holds that voters perceive a specific competence or popularity of candidates based on specific characteristics z_i like charisma and appearance. Furthermore, the variable party identification PI_i is also part of the utility function because it accentuates the preferences from voters for a party's candidate.

$$V_{ik}^{NP} = \sum_j^J \alpha_{kj} x_{ij} + \alpha_k y_{ig} + \alpha_k z_i + \sum_k^K \alpha_k PI_i \quad (2.5)$$

The policy oriented voter's utility function was calculated based on the spatial voting model (Davis et al., 1970; Enelow and Hinich, 1984), as the weighted distance between a voter's position x_{di} on a specific issue d and the perceived position taken by the party or candidate y_{dik} on the same issue:

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$$V_{ik}^P = -\sum_d^D \beta_d (y_{dik} - x_{di})^2 \quad (2.6)$$

Notice that the coefficient β is always negative, because the greater the distance between the voter's position and the party/candidate's position, the less is the utility. In the case of the alternative Abstention, the distance was set as the minimal negative distance. This means, the distance between the voter's policy position and the perceived policy position of the nearest party. This agrees with the voting paradox, which states that usually the cost of voting is higher than their expected benefit. Therefore, the greater the distance, the higher is the utility from abstaining.

The multinomial logit model already described assumes that all voters act homogeneously. However, since we are also interested in analyzing the impact of voter behavior on government performance, more specifically on government accountability and capture, heterogeneity must be allowed as it is a necessary condition for the existence of capture. Therefore, this model needed to be extended to a latent class model. So now the probability that voter i chooses alternative k is class-specific (c).

$$P_{ikc} = \frac{e^{V_{ikc}}}{\sum_{k=1}^K e^{V_{ikc}}} \text{ where } V_{ikc} = V_{ikc}^{NP} + V_{ikc}^P \quad (2.7)$$

The classes are generated based on the individual socio-demographic characteristics of the voter. We refer to the vector containing these characteristics as covariates. An iterative process is used to determine class-specific utility functions and the probability of class membership. The optimal model is determined by means of the Akaike Information Criterion (AIC).

In the latent class model the voter has an additional utility v_{ic} if he belongs to a group because of his socio-demographic characteristics x_{ij} and therefore chooses differently from another group.

$$v_{ic} = \alpha_c + \sum_j^J b_{cj} x_{ij} \quad (2.8)$$

Based on this utility v_{ic} , a probability p_{ic} that an individual belongs to a class is calculated:

$$p_{ic} = \frac{e^{v_{ic}}}{\sum_{c=1}^C e^{v_{ic}}} \quad (2.9)$$

Then, in order to calculate the probability of the classes, one has to weight the probability that voter i chooses alternative k given that he belongs to class c (P_{ikc}) with the probability that voter i actually belongs to class c (p_{ic}):

$$\bar{P}_{ik} = \sum_c^C P_{ikc} * p_{ic} \quad (2.10)$$

2.2.2. Government Performance

In order to assess government performance, the indicators for capture and accountability were derived. Since the probability P_{ik} is logistically distributed, the algebraic signs of the coefficients indicate the direction of the impact, but the absolute values cannot be interpreted. Hence, marginal effects (ME) were calculated, as they show how sensitive voters are to changes in policy and non-policy components.

$$ME_{ic}^{NP} = \frac{\partial P_{ikc}}{\partial y_{ig}} = \left| P_{ikc} \left(\alpha_k - \sum_k^K \alpha_k * P_{ikc} \right) \right| \quad (2.11)$$

$$ME_i^{NP} = \sum_c^C ME_{ic}^{NP} * p_{ic} \quad (2.12)$$

$$ME_{ic}^P = \frac{\partial P_{ikc}}{\partial x_{di}} = |2\beta_d (y_{dik} - x_{di}) P_{ikc} (1 - P_{ikc})| \quad (2.13)$$

$$ME_i^P = \sum_c^C ME_{ic}^P * p_{ic} \quad (2.14)$$

These marginal effects point out the extent to which the probability P_{ik} changes when there is a one unit change in the independent variables.

To evaluate the relative importance of the voting motives, the relative marginal effects (RME) were calculated for each voter:

$$RME_i^{NP} = \frac{ME_i^{NP}}{ME_i^{NP} + ME_i^P} \quad (2.15)$$

$$RME_i^P = \frac{ME_i^P}{ME_i^{NP} + ME_i^P} \quad (2.16)$$

Government Accountability

Electoral competition should encourage governments to develop and implement efficient policies. However, low accountability exists when the government lacks incentive to implement policies that promote prosperity for the whole society. The implementation of inefficient policies occurs if voters choose mainly based on non-policy motives. In this case, the function of elections related to control the government is not sufficiently fulfilled. Accordingly, we derived a government accountability index (*GA*) based on the relative marginal effects.

$$RME^{NP} = \sum_{i=1}^n RME_i^{NP} \quad (2.17)$$

$$RME^P = \sum_{i=1}^n RME_i^P \quad (2.18)$$

$$GA = \frac{RME^P}{RME^{NP} + RME^P} \quad (2.19)$$

Government Capture

When governments attend the concerns of special interest groups and fails to act in the public interest, emerges government capture. In other words, the implementation of biased policies is the result of high levels of government capture. Hence, we assumed that the more policy oriented a voter chooses, the more importance he has for parties. Consequently, for the purpose of determining the government capture index (*GC*), we first calculated the individual relative political weights:

$$g_i = \frac{ME_i^P}{\sum_{i=1}^n ME_i^P} \quad (2.20)$$

Since voters cannot influence a political process individually, it is interesting to analyze

different groups from the electorate to identify those with a greater political weight.

$$GC_{1vs2} = \frac{\sum_{i \in 1} g_i}{\frac{a_1}{\sum_{i \in 2} g_i}} \quad (2.21)$$

where a_1 and a_2 are the share of voters in group 1 and 2 respectively.

2.3. Data

A voter survey including questions on socio-demographic characteristics, voting behavior, policy positions and network characteristics was designed by Seide (2014). The survey was carried out in Uganda in June 2013 in collaboration with Wilsken Agencies Ltd. The interviews were conducted face-to-face in the respective first language of the interviewee.

The sample contains 620 individuals, who were interviewed in 26 different districts. After data cleaning 471 complete observations were available for the analysis.

2.3.1. Dependent Variable

In a probabilistic voter model the dependent variable is usually the actual or intended vote choice. In the questionnaire, respondents were asked:

If a presidential election were held tomorrow, which party's candidate would you vote for?

To include the alternative Abstention, the answers "will not vote" and "don't know" were considered following the approach of Thurner and Eymann (2000).

Table 2.1 shows the results of the survey, as well as, the official presidential election results. Although the survey results are not close to the actual election outcome, they did predict correctly the winner of the election. Furthermore, the vote distribution clearly shows that electoral competition in Uganda corresponds to a two-party contest. Therefore, for the analysis in the empirical section we only considered the main parties (National Resistance Movement and Forum for Democratic Change) and the alternative Abstention, while the remaining small parties were dropped.

2.3.2. Independent Variables

Policy Voting: Seven different policy issues are considered. The policy positions on these issues were asked based on a five-point scale and were presented as follow:

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Table 2.1.: Presidential election results from Uganda

	NRM	FDC	DP	UPC	others	Abstention
Presidential Election 2011	39.86%	15.16%	1.09%	0.92%	1.26%	41.71%
Survey 2013	62.14%	22.52%	3.11%	1.17%	1.94%	9.13%

Source: African Elections Database (2014), Seide (2014)

- 1-Agree with liberal policies, 5-Disagree with liberal policies (Social)
- 1-Tax revenues should be used to provide public goods, 5-Tax revenues should be used to improve economic growth (Economic)
- 1-Economic growth shall be achieved through the agricultural sector, 5-Economic growth shall be achieved through the industrial (non-agricultural) sector (AgrvsInd)
- 1-Economic growth through technological progress, 5-Economic growth through better market access (TPvsMA)
- 1-Promotion of cash crops, 5-Promotion of food crops (CashvsFoodcrops)
- 1-Agricultural sector should be taxed, 5-Agricultural sector should be supported (TaxvsProtect)
- 1-Governmental decision making process without the population, 5-Governmental decision making process including the population (Accountability)

Non-policy Voting: A whole set of sociodemographic variables such as gender, age, employment and education was included. In addition, regions and ethnic groups were coded as dummy variables. Also, the variable party identification, reflecting whether the voter feels close to any political party, was added, as well as, the variable polint that measures people's awareness of politics. Based on Mattes (2008), a Lived Poverty Index (LPI) was estimated. The level of poverty is high if it is closer to 5 and low if it is closer to 1. Likewise, an Ownership Index (OI) was calculated, where the number of possessions increases when the index approximates 6 and it decreases the closer it is to 0. Furthermore, a set of questions was incorporated asking the respondents to evaluate, on a five-point scale, how the government is handling specific country matters. More in detail, issues like: managing the economy, keeping prices down, narrowing the income gap, creating jobs, reducing crime, addressing educational needs, improving health services, providing supply of electricity, maintaining roads and bridges and providing sanitation services among

others. With the variables generated from these questions, we conducted a factor analysis looking to reduce the number of variables in the estimation and to avoid collinearity issues. Finally, we reached a three-factors solution that we named: Gov_Perf_Security, Gov_Perf_Economy and Gov_Perf_Services.

2.4. Empirical Application and Results

2.4.1. Latent Class Model

With the data described in the former section we estimated probabilistic voter models with latent class to determine which factors influence voting behavior in Uganda. The latent class model (LCM) approach has the advantage of considering the heterogeneity of the data. It consists of two sub-models, the model for choices that determines which alternative is chosen and the model for classes that defines class membership. In the latter, the sociodemographic characteristics of the voter are included as covariates. In order to also evaluate the impact of those voters who refrained from participating in the electoral process, we included the alternative Abstention in our estimations.

Different model specifications were estimated, where NRM was taken as the reference party and the goodness of fit was measured with the Akaike Information Criterion (AIC). For the purpose of this paper, we present and analyze the best two models. They include independent variables that were significant for at least one class and/or alternative, and they were chosen via the z-score test. The size of the class memberships are 54.32% and 45.68% for the first model, and 50.01% and 49.99% for the second model. This evidences a strong heterogeneity.

As tables 2.2 and 2.3 show, the intercepts take all information not included in the remaining variables. Furthermore, concerning the attributes, the coefficients of significant issues are consistent with the literature, as they have a negative sign indicating that the probability to choose a party decreases when the distance between such party and the voter increases. On the contrary, in the case of abstention, the greater the distance, the higher is the probability to abstain. Regarding the predictors, the better the voters think that the government have been handling the specific country matters previously described and related to the economy, security and services, the lower is the probability that they will abstain or support the opposition party with respect to the incumbent. Likewise, if the voter has party identification, he is unlikely to abstain or to vote for the opposition

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party FDC.

Table 2.2.: Model 1

AIC = 606.5399						
VARIABLES	Class 1 (0.5432)			Class 2 (0.4568)		
Model for Choices	Coeff.	z-value		Coeff.	z-value	
<i>Attributes</i>						
Abstention:(intercept)	-0.8283	-2.1939	*	-2.3866	-2.1365	*
FDC:(intercept)	-1.8225	-4.0712	***	0.4084	0.8633	
disEconomic	-0.0372	-1.1463		-0.1752	-3.0949	**
disAgricvsInd	0.0075	0.2216		-0.1584	-2.6050	**
disAccountability	0.0352	1.2859		-0.0821	-2.3652	*
<i>Predictors</i>						
Abstention:Gov_Perf_Economy	-0.0751	-0.3147		-4.8955	-2.9022	**
FDC:Gov_Perf_Economy	-0.3357	-1.0002		-0.7960	-2.9960	**
Abstention:Gov_Perf_Security	-0.2495	-1.1711		-3.6663	-2.2614	*
FDC:Gov_Perf_Security	-0.6004	-2.4789	*	-0.6342	-2.6375	**
Abstention:Party_ID	-2.1676	-4.5016	***	-15.3732	-1.5805	
FDC:Party_ID	-0.9164	-1.4573		-0.9780	-1.8338	.
Model for Classes						
<i>Covariates</i>						
classes:intercept	3.1512	1.7227	.			
classes:polint	-1.8587	-3.2458	**			
classes:age	0.0920	2.6560	**			
classes:education	-0.7364	-2.0297	*			
classes:OI	-9.1788	-3.5169	***			
classes:gender	1.5239	2.0569	*			
classes:Muganda	2.8790	2.1946	*			
classes:marital_status	2.3454	2.1092	*			

***p<0.001, **p<0.01, *p<0.05, . p<0.10

Source: Own estimation

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Table 2.3.: Model 2

AIC = 618.6980						
VARIABLES	Class 1 (0.5001)			Class 2 (0.4999)		
Model for Choices	Coeff.	z-value		Coeff.	z-value	
<i>Attributes</i>						
Abstention:(intercept)	-1.1395	-3.2390	**	-1.3097	-1.6784	.
FDC:(intercept)	-2.2792	-3.0482	**	0.4719	0.9723	
disEconomic	-0.0117	-0.3047		-0.1266	-3.3141	***
disAgricvsInd	-0.0219	-0.6100		-0.0964	-2.5393	*
<i>Predictors</i>						
Abstention:Gov_Perf_Economy	0.0476	0.1961		-3.7054	-2.8995	**
FDC:Gov_Perf_Economy	-0.7368	-1.0850		-0.7052	-3.3753	***
Abstention:Gov_Perf_Security	-0.2007	-0.8869		-2.1988	-2.9023	**
FDC:Gov_Perf_Security	-0.4012	-1.1421		-0.7960	-3.2634	**
Abstention:Gov_Perf_Services	0.0474	0.2019		0.6422	0.9866	
FDC:Gov_Perf_Services	-0.1317	-0.3643		-0.3733	-1.7111	.
Abstention:Party_ID	-2.2239	-4.1824	***	-8.2770	-3.5631	***
FDC:Party_ID	-1.1179	-1.2865		-0.8708	-1.7864	.
<i>Model for Classes</i>						
<i>Covariates</i>						
classes:intercept	4.9937	1.8599	.			
classes:polint	-1.5114	-2.5892	**			
classes:age	0.0717	2.5794	*			
classes:education	-1.0494	-1.9408	.			
classes:OI	-7.1377	-2.8958	**			
classes:gender	1.5765	2.2123	*			

***p<0.001, **p<0.01, *p<0.05, . p<0.10

Source: Own estimation

In the model for classes, the positive and significant intercepts reflect a bias towards being part of class 1. In addition, the variables education, OI and polint have a significant

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negative influence, meaning that the higher the level of education, the ownership index (an alternative measure of the poverty level), and the interest in politics, the higher is the probability of such voter to be part of class 2. The positive coefficient of the significant variables gender, age, Muganda and marital status, suggest that if the voter is a woman, belongs to the group of older voters, is part of the Muganda tribe and is married, is likely to belong to class 1.

Looking more in detail, table 2.4 shows the sociodemographic characteristics for both models and a t-test indicating where the differences between the two classes are significant. Here, it is worth noting that, for both models, class 1 is mostly represented by poor people, women, older voters, uneducated people and farmers. Furthermore, when looking at the ethnicity, the voters from Mutooro tribe have a tendency be part of class 2. Regarding the regions, voters from the North are more likely to belong to class 1 whereas those living in the West side of the country to class 2. Finally, people supporting the ruling party NRM and those who choose the alternative Abstention tend belong to class 1, whereas FDC supporters are more likely to be part of class 2.

Table 2.4.: Sociodemographic characteristics

	Model 1			Model 2		
	mean C1	mean C2	p-value	mean C1	mean C2	p-value
LPI	1.1440	0.9990	0.0390	1.1590	0.9950	0.0180
OI	0.1750	0.3840	0.0000	0.1600	0.3820	0.0000
gender	0.6630	0.3150	0.0000	0.7080	0.2980	0.0000
age	38.4710	31.2130	0.0000	38.7540	31.5150	0.0000
education	1.9450	2.8940	0.0000	1.8090	2.9530	0.0000
farmer	0.8240	0.6710	0.0000	0.8260	0.6810	0.0000
Mutooro	0.0670	0.1300	0.0240	0.0680	0.1230	0.0400
North	0.2900	0.2080	0.0400	0.3310	0.1740	0.0000
West	0.2040	0.3330	0.0020	0.2120	0.3150	0.0110
Choosing NRM	0.7626	0.5603	0.0000	0.7745	0.5631	0.0000
Choosing FDC	0.1261	0.3757	0.0000	0.1092	0.3756	0.0000
Choosing Abstention	0.1113	0.0640	0.0006	0.1163	0.0614	0.0000

Source: Own estimation

Once we estimated the optimal models, the next step was to calculate the utilities and probabilities. Table 2.5 displays the mean probability for each alternative and model. In both models we observed similar results, with the ruling party NRM having the highest

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probability of winning the elections.

Table 2.5.: Mean probabilities

Alternatives	Model 1	Model 2
NRM	66.98%	66.90%
FDC	24.06%	24.21%
Abstention	8.96%	8.89%

Source: Own estimation

2.4.2. Government Performance Indicators

In order to assess how sensitive the voters are to changes in policy and non-policy voting components, relative marginal effects were estimated. To do so, it was necessary to first calculate absolute marginal effects (ME). Since we estimated LC models, ME were calculated only for the variables in the model for choices and thus, the covariates were left out.

Table 2.6 displays the RME that allow us to evaluate how important is each voting component. Clearly, RME of the non-policy component is the most relevant, with over 80% in all cases. The RME of the policy voting component in turn, was found to be less important. These results suggest, that in general the government has a lack of incentives to apply efficient policies.

Table 2.6.: Relative Marginal Effects

NRM vs. Abstention	mean	mean	p-value	mean	mean	p-value
Policy	0.1515	0.0443	0.0000	0.0911	0.0253	0.0000
Non-Policy	0.8485	0.9557	0.0000	0.9089	0.9747	0.0000
FDC vs. Abstention	mean	mean	p-value	mean	mean	p-value
Policy	0.1679	0.0443	0.0000	0.1047	0.0253	0.0000
Non-Policy	0.8321	0.9557	0.0000	0.8953	0.9747	0.0000

Source: Own estimation

More specifically, it is clear that people who abstain tend to choose more non-policy oriented than those who choose to participate in the elections. Conversely, the voters that

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choose the alternative FDC, decide more policy oriented than their counterparts choosing the incumbent party.

We have shown that the group of non-voters based their decision mostly on non-policy variables, namely government performance factors and party identification. The former did not exhibit a significant difference between those thinking that the government handles country matters well and those thinking otherwise. On the other hand, in our results almost 83% of abstainers have no party identification. Therefore, according to the models, if this group of people decided to vote, they might choose the opposition party FDC. Additionally, although in our data only 9.13% said they would abstain and that percentage would not be enough to change the results in favor of FDC, when looking at the actual results of the elections, 41.71% of people abstained. This in turn, might imply a change in the results towards the opposition party FDC.

After knowing how voters make their decision, we proceeded to estimate accountability indices to determine if the function of elections of holding the government accountable is fulfilled. The low indices displayed in table 2.7 suggest that the government in Uganda is not hold accountable by the electorate and therefore, it might implement inefficient policies that privilege the interests of lobbying groups at the expense of the interests of the entire society. Nonetheless, it is worth to highlight that those who do not support the ruling party NRM have a higher accountability index than the NRM supporters.

Table 2.7.: Accountability indices

	Model 1	Model 2
NRM	0.1515	0.0911
Non-NRM	0.2035	0.1307

Source: Own estimation

To determine which group of voters is favored by the policies applied by the government, the political weight of specific groups was measured by means of the estimation of capture indices. We selected the same specific groups for each model, and table 2.8 shows that, the direction of capture coincides in all cases. Further in detail, Christians capture other religions, people living outside the central region capture those residents of the central whereas, the voters located in the East part of the country capture others. As expected, class 2 captures class 1, and as previously mentioned among the groups being part of

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class 2 are: men, young, non-married, educated, non-farmers, people with higher level of ownership, and those living in regions other than the North. Furthermore, it is important to note that Non-NRM voters capture the NRM voters and therefore, they should be taken into account by the government in the policy-making process.

Table 2.8.: Capture indices

	Model 1	Model 2
Women vs. Men	0.6355	0.4967
Old vs. Young	0.6668	0.7414
Married vs. Other	0.7440	0.8796
Christian vs. Other	1.2234	1.2527
Educated vs. Uneducated	1.6610	1.9360
Farmer vs. Non-farmer	0.7285	0.7657
Low OI vs. High OI	0.6608	0.6240
Central vs. Other	0.7582	0.9318
North vs. Other	0.6835	0.5927
East vs. Other	1.2591	1.5366
Class 1 vs. Class 2	0.3884	0.3120
NRM voters vs. Non-NRM voters	0.7087	0.6373

Source: Own estimation

To be more specific, as displayed in table 2.9 the Non-NRM voters are less poor than NRM supporters. Furthermore, in this group of people that do not support the incumbent party, are more men, young and educated people, non-farmers, non-married and employed. Also, voters from the Muganda ethnicity and residents of regions other than the North do not back up the ruling party. These groups in turn, might incentive the government to implement efficient policies to reduce poverty and undernutrition in Uganda.

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Table 2.9.: NRM vs. Non-NRM Voters

	mean NRM	mean Non-NRM	p-value
LPI	1.1290	0.9750	0.0310
OI	0.2400	0.3330	0.0000
gender	0.5480	0.4140	0.0060
age	37.1620	31.1020	0.0000
education	2.2320	2.6750	0.0000
farmer	0.8030	0.6560	0.0010
marital_status	0.7200	0.6240	0.0400
employment	0.1460	0.2680	0.0030
Muganda	0.2010	0.2740	0.0840
North	0.2800	0.1970	0.0430

Source: Own estimation

2.5. Summary and Conclusions

Uganda is a republic with a presidential system and a short history of multi-party elections. The current president Yoweri Museveni has been in power since 1986, and has won all electoral processes since the change towards a multi-party system established in 2006. The most prominent political parties are the ruling (right wing party) National Resistance Movement (NRM) and the (center-right) Forum for Democratic Change (FDC). The data used in this empirical study corresponds to a survey designed by Seide (2014) that was carried out in 2013 in collaboration with Wilsken Agencies Ltd.

In order to show the heterogeneous behavior among voters, we performed LC models. The variables with significant influence in the model for choices were policy issues, variables concerning how the government is handling specific country matters and party identification. Also, based on the sociodemographic characteristics of voters, the LC analysis allowed us to determine two classes of voters. For instance, class 1 was mainly represented by those usually marginalized, such as, poor people, women, older voters, uneducated people and farmers, whereas class 2 gathered their counterparts. Concerning the estimated mean probabilities, our results resemble the official outcome of the 2011 presidential election, as the ruling party NRM turned out to be the winner with a considerable difference.

According to the RME of the two voting components, both models agree that the non-

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policy component is the most important among all groups of voters. Furthermore, it is worth noting that the aforementioned statement include the large percentage of people who decide not to participate in the elections. The low indices of accountability suggest that the government might implement inefficient policies that privilege the interests of lobbying groups at the expense of the interests of the whole society. Nonetheless, it is important to highlight that those who do not support the ruling party NRM have a higher accountability index than the NRM supporters. As expected, the class mostly represented by privileged groups, such as men, educated, non-farmers, people with higher level of ownership, and those living in regions other than the Northern region (the poorest in the Uganda), have a higher average political weight. In addition, it is relevant to note that Non-NRM voters capture the NRM voters, thus, they should be considered in the policy-making process as they might incentive the government to implement efficient policies to reduce poverty and undernutrition in the country.

Finally, we conclude that, the political process in Uganda is biased. The fact that the non-policy component is more relevant than the policy component, implies that the government is not accountable towards the voters and elections are not an effective mechanism to promote democracy. This could explain why the current president has been ruling the country for over 30 years, which is a very a long time even for African standards. However, as our results suggest, if most of the people who abstain decided to cast a vote, the final electoral outcome could change in favor of the opposition party FDC.

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3. Chapter

Do Ethnicity and Gender Influence Government Performance in Uganda?: Empirical Estimations with Latent Class Models

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Abstract

Inequality issues in Uganda, entail aspects of identity such as gender and ethnicity. Women and minor ethnic groups are usually relegated or even denied political rights, access to education, adequate health care and land rights. In this paper, we estimated probabilistic voter models with latent class to determine the influence of gender and ethnicity variables on voting behavior in Uganda. Additionally, to evaluate the impact of voters who refrained from participating in the electoral process, we included the alternative Abstention in our estimations. The relative marginal effects of the voting motives indicate that the electorate in Uganda chooses in general more non-policy oriented. More specifically, when it comes to gender, men tend to choose more policy oriented than women. However, when looking at the level of education of women, it is worth noting that educated women choose more policy oriented than the uneducated. Thus, if the level of education of women in Uganda increases, they might incentive the government to apply better policies. As regards the ethnicities, the Lugbara tribe, in spite of not being among the biggest ethnicities in Uganda, could motivate the incumbent to implement more efficient policies because it chooses more policy oriented than other ethnicities, in other words, it has a higher accountability index. Nonetheless, Musoga ethnicity captures Lugbara as it has a higher political weight and therefore, it could exercise more influence in the policy-making process.

3.1. Introduction

The concept of inequality often refers to differences in income, but it also entails aspects of identity such as gender and ethnicity. In Uganda, gender inequality is the most significant of all identity-based disadvantages. Women are mainly dedicated to domestic household work and raising children. They do not always make decisions about their own employment and, if they work outside the home, they earn less than men. Additionally, most employed women are engaged in low-paying sectors. Frequently, they are also denied the rights to education and land. Also marginalized are the ethnic minorities. In Uganda there is a large number of diverse ethnic groups. Some of them are affected by uneven development, inadequate health care and poor education, among other problems. Ethnic minorities also face violations regarding land and political rights.

Many researchers have addressed the discrimination against women in Uganda. For example, Atekyereza (2001) argues that the reasons for girls not attending or dropping

out school have been categorized as sociocultural, economic, policy-related and political. Additionally, Kasirye and Kasirye (2011) found that gender discrimination in the labor market can take many forms, from restricted access to certain jobs to differential payment. Furthermore, Pedersen et al. (2012) explain that studies and surveys from different regions in Uganda show that women are discriminated in terms of access to land. On the other hand, fewer papers have been written about discrimination against ethnic minorities. One example is the research from Moradi and Baten (2005) who analysed inequality data from many countries across Africa, including Uganda. They conclude that the bigger the ethnic group, the lower is the inequality. In particular, they found evidence of U-shape relationship between ethnic fractionalization and health inequality. In addition, a report of the Minority Rights Group International (2009) highlights that discrimination against children from ethnic minorities, and the quality of education they receive, were identified as major issues in Uganda.

Regarding the role of disadvantaged groups in politics, Tripp (1994) explains that the proliferation of women's informal and formal associations have transformed the political consciousness of women, which in turn have caused political changes. Therefore, it is possible to see institutional reforms that would make politics more participatory and inclusive and leadership more accountable. Further, Ottemoeller (1999) evaluates the implications of women's increased role in politics and suggests that they constitute a potentially influential voting bloc. According to Ogwang (2019), although some ethnic groups seem to be underrepresented and others overrepresented in Uganda's Parliament, these differences are not statistically significant. On the contrary, Singiza and Visser (2015) state that the underrepresentation of minority ethnic groups in the leadership of district councils is notable, which is against the principle of representative local democracy. Finally, Wordofa (2004) points out that policy makers, who design and implement poverty-reduction strategies, should involve marginalized groups in the decision making processes.

Electoral processes are considered important democratic mechanisms. They should contribute to control the government and to serve the interests of the society. However, in real life, electoral competition usually leads to policy failure because voters are non-policy oriented when it comes to make their voting decision. An example of this failure is the development and implementation of inefficient and biased policies favoring special interests. Such distortions in the policy making process are explain by two major problems of political performance: government capture and government accountability. In the case

of the aforementioned Uganda's marginalized groups, their access to education is limited compared to other privileged groups. This in turn, could be a reason contributing to the predominance of non-policy voting. Thus, the government could neither have incentives to consider them in the policy making progress, nor to implement efficient policies.

This paper is written as follows: In the first part we described the theoretical model with latent class used in our analysis. In the second part we present the data and variables of the study. The next section shows the results of the latent class model estimations for the two best models. Finally, in the last section we present the summary and conclusions.

3.2. Methodology

3.2.1. Voter Behavior

When voters decide to participate in an election and their behavior is modeled taking into account the rational choice approach, researchers differentiate between a deterministic and a probabilistic voter model. In the deterministic voter model, the voting decision depends on the party differential $V_{iA} - V_{iB}$. In empirical research, however, it is not possible to observe and control all the factors involved in the voting decision process. Therefore, it is more suitable to estimate a probabilistic voter model that makes possible the inclusion, in the utility function, of an individual-specific stochastic component μ_{ik} containing these unknown factors.

$$P_{iA}(A, B) = Prob(U_{iA} \geq U_{iB}) \text{ where } U_{ik} = V_{ik} + \mu_{ik}, k = A, B \quad (3.1)$$

Probabilistic voter models are estimated with Discrete Choice models, since they explain choices between two or more alternatives. As regards this research study, the alternative Abstention was also included in the choice set. In the context of voter behavior, the Discrete Choice models are exceptionally suitable, as researchers are more interested in the way results were achieved rather than the actual results. The set of alternatives must satisfy three requirements, i.e. all parties must be present on the ballot (*collectively exhaustive*) unless the voter decides to abstain. Each voter is allowed to choose only one alternative (*mutually exclusive*) and there is only a *finite number of alternatives*.

To derive the Discrete Choice model, it is common to apply a Random Utility Max-

imization (RUM) Model. Here, if the voter i decides to participate in the election, he chooses party k only if this party provides him the highest utility U_{ik} . Similarly, if the voter chooses not to participate, the greater utility comes from the alternative Abstention.

We assumed that the random unknown part μ_{ik} of the utility function U_{ik} is independently, identically extreme value distributed (iid), and thus a logit model was derived. This model can be extended to a multi-alternative estimation, meaning that voters can choose an alternative k from a set of alternatives K . In this sense, the logit probability model can be derived as (McFadden, 1974):

$$P_{ik}(K) = \frac{e^{V_{ik}}}{\sum_{k=1}^K e^{V_{ik}}} \quad (3.2)$$

The models estimated include two voting motives: non-policy and policy. On the one hand, not all voters are well informed and aware of policies, especially in developing countries. Therefore, they might apply non-policy indicators to estimate their expected utility, such as their socio-demographic characteristics x_{ij} . Among these characteristics, and given the nature of this study, we highlight ethnicity and gender. Additionally, party identification PI_i is included in the utility function as it intensifies the favoritism towards a party's candidate.

$$V_{ik}^{NP} = \sum_j^J \alpha_{kj} x_{ij} + \sum_k^K \alpha_k PI_i \quad (3.3)$$

On the other hand, the policy oriented voter's utility function is based on the spatial voting model (Davis et al., 1970; Enelow and Hinich, 1984), as the weighted distance between a voter's position x_{di} and the perceived position taken by the party y_{dik} on an issue.

$$V_{ik}^P = -\sum_d^D \beta_d (y_{dik} - x_{di})^2 \quad (3.4)$$

It should be noted, that the greater the distance between the voter's position and the candidate's position, the less is the utility. Therefore, the coefficient β in the formula is always negative. For the alternative Abstention we used the minimal negative distance. Then, the greater the distance, the greater is the benefit from abstaining, which agrees with the voting paradox.

The model described assumes that voters act homogeneously. However, since we are

interested in allowing heterogeneity for gender and ethnicity, it was extended to a latent class model (LCM). So now the probability that voter i chooses alternative k is class-specific (c).

$$P_{ikc} = \frac{e^{V_{ikc}}}{\sum_{k=1}^K e^{V_{ikc}}} \quad (3.5)$$

The classes were generated based on socio-demographic characteristics (mainly gender and ethnic groups). Here, the voter has an additional utility if he belongs to a group because of his characteristics x_{ij} and thus, chooses differently than other groups.

$$v_{ic} = \alpha_c + \sum_j^J b_{cj} x_{ij} \quad (3.6)$$

Based on this utility, a probability of belonging to a class is calculated as follows:

$$p_{ic} = \frac{e^{v_{ic}}}{\sum_{c=1}^C e^{v_{ic}}} \quad (3.7)$$

Then, to calculate the probability, we weighted the probability that a voter i chooses an alternative k given that he belongs to a class c with the probability that he actually belongs to that class:

$$\bar{P}_{ik} = \sum_c^C P_{ikc} * p_{ic} \quad (3.8)$$

3.2.2. Government Performance

To assess government performance, marginal effects ME are calculated, as they show the sensitivity of voters to changes in policy and non-policy voting motives.

$$ME_{ic}^{NP} = \frac{\partial P_{igc}}{\partial y_{ig}} = \left| P_{igc} \left(\alpha_g - \sum_k^K \alpha_k * P_{ikc} \right) \right| \quad (3.9)$$

$$ME_i^{NP} = \sum_c^C ME_{ic}^{NP} * p_{ic} \quad (3.10)$$

$$ME_{ic}^P = \frac{\partial P_{igc}}{\partial x_{di}} = |2\beta_d (y_{dig} - x_{di}) P_{igc} (1 - P_{igc})| \quad (3.11)$$

$$ME_i^P = \sum_c^C ME_{ic}^P * p_{ic} \quad (3.12)$$

To evaluate the relative importance of the voting motives, the relative marginal effects RME are calculated for each voter as follows:

$$RME_i^{NP} = \frac{ME_i^{NP}}{ME_i^{NP} + ME_i^P} \quad (3.13)$$

$$RME_i^P = \frac{ME_i^P}{ME_i^{NP} + ME_i^P} \quad (3.14)$$

Government Accountability

Electoral competition should encourage governments to develop and implement efficient policies. However, we assume that government accountability is low when voters choose more non-policy oriented and viceversa. Accordingly, we derive a government accountability index GA based on the relative marginal effects.

$$RME^{NP} = \sum_{i=1}^n RME_i^{NP} \quad (3.15)$$

$$RME^P = \sum_{i=1}^n RME_i^P \quad (3.16)$$

$$GA = \frac{RME^P}{RME^{NP} + RME^P} \quad (3.17)$$

Government Capture

Finally, we assume that the more policy oriented a voter chooses, the more importance he has for parties. Consequently, for the purpose of determining the government capture index GC , we first calculate the individual relative political weights.

$$g_i = \frac{ME_i^P}{\sum_{i=1}^n ME_i^P} \quad (3.18)$$

Since voters cannot influence a political process individually, we analyze different groups to identify those with a greater political weight.

$$GC_{1vs2} = \frac{\sum_{i \in 1} g_i}{\frac{a_1}{\sum_{i \in 2} g_i}} \quad (3.19)$$

where a_1 and a_2 are the share of voters in group 1 and 2 respectively.

3.3. Data

A voter survey including questions on socio-demographic characteristics, voting behavior, policy positions and network characteristics was designed by Seide (2014). The survey was carried out in Uganda in June 2013 in collaboration with Wilsken Agencies Ltd. The interviews were conducted face-to-face in the respective first language of the interviewee.

The sample contains 620 individuals and, after data cleaning, 471 observations were available for the analysis.

3.3.1. Dependent Variable

In a probabilistic voter model the dependent variable is usually the actual or intended vote choice. In the questionnaire, respondents were asked:

If a presidential election were held tomorrow, which party's candidate would you vote for?

As pointed by Thurner and Eymann (2000), the number of people who decide not to participate in an election is usually underestimated in surveys due to effects of social (un)desirability. Therefore, following the aforementioned approach we have considered the interviewees who revealed their intention of abstaining, as well as, the potential non-voters. In other words, we have taken into account those interviewees who answered "Will not vote" and "Don't know" as part of the Abstention alternative.

Table 3.1 shows the results of the survey, as well as, the official presidential election outcome. Although the survey results are not close to the actual election outcome, they did predict correctly the winner of the election. Furthermore, the vote distribution clearly

shows that electoral competition in Uganda corresponds to a two-party contest. Therefore, for the analysis in the empirical section we only considered the main parties (National Resistance Movement and Forum for Democratic Change) and the alternative Abstention, while the remaining small parties were dropped.

Table 3.1.: Presidential election results from Uganda

	NRM	FDC	DP	UPC	others	Abstention
Presidential Election 2011	39.86%	15.16%	1.09%	0.92%	1.26%	41.71%
Survey 2013	62.14%	22.52%	3.11%	1.17%	1.94%	9.13%

Source: African Elections Database (2014), Seide (2014)

3.3.2. Independent Variables

Policy Voting: Seven different policy issues related to ideology, economic growth, agriculture and participation are considered. The policy positions on these issues were asked based on a five-point scale. With this information, distances were calculated as the difference between the voters' policy positions and the perceived policy positions of the parties/candidates. Moreover, for the alternative Abstention we used the minimal negative distance, that is, the distance to the nearest party/candidate.

Non-policy Voting: The variable party identification, as well as, a whole set of sociodemographic variables were included in the estimations. For this study we focused mainly on those variables related to ethnicity and gender. Furthermore, a group of questions was incorporated asking the respondents to evaluate, on a five-point scale, how the government is handling specific country matters. With the variables generated from these questions, we conducted a factor analysis looking to reduce the number of variables in the estimation and to avoid collinearity issues. Finally, we reached a three-factors solution: Gov_Perf_Security, Gov_Perf_Economy and Gov_Perf_Services.

3.4. Empirical Application and Results

3.4.1. Latent Class Model

With the data described in the former section we estimated probabilistic voter models with latent class to determine whether variables related to ethnicity and gender influence

voting behavior in Uganda. Since the latent class model (LCM) approach has the advantage of considering the heterogeneity of the data, it was possible to observe if there was heterogeneity among men and women, as well as, among ethnic groups. The LCM consists of two sub-models, the model for choices that determines which alternative is chosen and the model for classes that defines class membership. In the latter, the sociodemographic characteristics of the voters are included as covariates. In order to also evaluate the impact of those voters who refrained from participating in the electoral process, we include the alternative Abstention in our estimations.

Different model specifications were estimated and the goodness of fit was measured with the Akaike Information Criterion (AIC). For the purpose of this paper, we present the estimation including all ethnic groups in Uganda from which data was available (Model 1), as well as, the estimation where only those ethnic groups that turned out to be significant were considered (Model 2). The models include independent variables that were significant for at least one class and/or alternative, and they were chosen via the z-score test. The size of the class memberships are 62% and 38% for the first model, and 63.37% and 36.63% for the second model. This evidences heterogeneity among the classes.

As tables 3.2 and 3.3 show, the intercepts take all information not included in the remaining variables. Furthermore, concerning the attributes, the coefficients of significant issues are consistent with the literature, as they have a negative sign indicating that the probability to choose a party decreases when the distance between such party and the voter increases. On the contrary, in the case of Abstention, the greater the distance, the higher is the probability to abstain. Regarding the predictors, the better the voters think that the government have been handling specific economic country matters, the lower is the probability that they will support the opposition party with respect to the incumbent. Similarly, if the voter has party identification, it is unlikely that he will abstain and very likely that he will vote for NRM.

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Table 3.2.: Model 1

AIC = 655.3003					
VARIABLES	Class 1 (0.6200)			Class 2 (0.3800)	
Model for Choices	Coeff.	z-value		Coeff.	z-value
<i>Attributes</i>					
Abstention:(intercept)	-0.6687	-2.0597	*	-12.5683	-1.2785
FDC:(intercept)	-6.6854	-1.2350		0.1845	0.3664
disEconomic	-0.0206	-0.6531		-0.1776	-2.9501 **
disAgricvsInd	-0.0623	-2.0667	*	-0.1027	-2.1694 *
<i>Predictors</i>					
Abstention:Gov_Perf_Economy	-0.1170	-0.4649		-0.1663	-0.0235
FDC:Gov_Perf_Economy	-1.4111	-2.6630	**	-0.5285	-2.1058 *
Abstention:Party_ID	-3.1255	-6.1929	***	2.3264	0.2086
FDC:Party_ID	3.8444	0.7148		-0.1688	-0.3388
Model for Classes					
<i>Covariates</i>					
classes:intercept	-2.7087	-3.0651	**		
classes:gender	1.7892	3.9887	***		
classes:Lugbara	-2.5961	-2.2327	*		
classes:Muganda	-0.2151	-0.3788			
classes:Mugishu	-0.6116	-0.8048			
classes:Munyankole	-1.3247	-1.5829			
classes:Musoga	-1.4632	-2.0453	*		
classes:Mutooro	-0.3784	-0.5498			
classes:age	0.0923	3.7698	***		

***p<0.001, **p<0.01, *p<0.05, . p<0.10

Source: Own estimation

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Table 3.3.: Model 2

AIC = 650.1269					
VARIABLES	Class 1 (0.6337)			Class 2 (0.3663)	
Model for Choices	Coeff.	z-value		Coeff.	z-value
<i>Attributes</i>					
Abstention:(intercept)	-0.6530	-1.9569	.	-12.5935	-1.2720
FDC:(intercept)	-6.7909	-1.2582		0.1150	0.2235
disEconomic	-0.0232	-0.7255		-0.1799	-2.8455 **
disAgricvsInd	-0.0604	-1.9993	*	-0.1007	-2.0452 *
<i>Predictors</i>					
Abstention:Gov_Perf_Economy	-0.1309	-0.5172		-0.2114	-0.0276
FDC:Gov_Perf_Economy	-1.4475	-2.8545	**	-0.4780	-1.8491 .
Abstention:Party_ID	-3.1616	-6.2413	***	2.3377	0.2090
FDC:Party_ID	4.0453	0.7539		-0.0505	-0.1013
<i>Model for Classes</i>					
<i>Covariates</i>					
classes:intercept	-2.7906	-3.4720	***		
classes:gender	1.7107	3.8508	***		
classes:Lugbara	-2.1579	-1.9367	.		
classes:Musoga	-1.1282	-1.8259	.		
classes:age	0.0866	3.6171	***		

***p<0.001, **p<0.01, *p<0.05, . p<0.10

Source: Own estimation

Concerning the model for classes, as it was already mentioned, in model 1 we included all ethnic groups in Uganda from which data was available. The next step was to replicate the estimation in model 2 but including only those ethnic groups that turned out to be significant for the first estimation, namely Lugbara and Musoga. The significant negative intercepts indicate that there is a bias towards belonging to class 2. The significant and negative coefficients of these variables suggest that voters belonging to any of these ethnic

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groups are more likely to be part of class 2. Similarly, the significant and positive coefficients of the variables gender and age indicate that class 1 is mostly represented by women and older people.

Finally, once we estimated the optimal models, the next step was to calculate the utilities and probabilities. Given the aim of this study, we display the mean probabilities by gender, ethnicity and class in Tables 3.4 and 3.5 for both models. It is clear that the ruling party NRM has the highest probability of winning the elections in all cases. It is worth noting that the government party receives more support from women, the ethnic groups Mutooro, Munyankole and Musoga, as well as, voters belonging to class 1. On the other hand, the majority of supporters of the opposition party FDC are men, people belonging to the Mugishu and Lugbara ethnicities and people in class 2. As regards abstention, women, people belonging to the Muganda, Musoga and Mutooro ethnicities, as well as, those voters part of class 1 are more likely to abstain.

Table 3.4.: Mean Probabilities Model 1

Probabilities Gender						
Alternatives	Women	Men				
NRM	70.91%	62.38%				
FDC	16.65%	32.68%				
Abstention	12.44%	4.94%				

Probabilities Ethnic Groups						
Alternatives	Lugbara	Muganda	Mugishu	Munyankole	Musoga	Mutooro
NRM	61.01%	61.53%	61.17%	70.03%	66.85%	70.82%
FDC	34.04%	26.93%	35.45%	27.02%	24.61%	20.91%
Abstention	4.95%	11.54%	3.39%	2.95%	8.54%	8.27%

Probabilities Classes		
Alternatives	Class 1	Class 2
NRM	72.06%	56.20%
FDC	17.15%	39.11%
Abstention	10.78%	4.69%

Source: Own estimation

Table 3.5.: Mean Probabilities Model 2

Probabilities Gender		
Alternatives	Women	Men
NRM	70.94%	62.34%
FDC	16.60%	32.75%
Abstention	12.47%	4.91%

Probabilities Ethnic Groups		
Alternatives	Lugbara	Musoga
NRM	60.86%	66.49%
FDC	33.91%	24.86%
Abstention	5.23%	8.65%

Probabilities Classes		
Alternatives	Class 1	Class 2
NRM	71.90%	55.69%
FDC	17.84%	38.87%
Abstention	10.27%	5.44%

Source: Own estimation

3.4.2. Government Performance Indicators

The coefficients of the models previously analyzed, allowed us to measure the direction of the impact on the probabilities for each alternative. However, in order to evaluate the magnitude of such impact, absolute marginal effects had to be calculated. In the case of the LC models, marginal effects can be calculated only for the variables included in the model for choices.

With the absolute marginal effects we could estimate the relative marginal effects (RME) to assess the importance of each voting motive. From table 3.6 it is evident the wide gap between the RME of each component in the model. More specifically, the RME of the non-policy component is the highest in all scenarios, with values over 70%. By contrast, the RME of the policy voting motive is the less relevant for all cases. Therefore, it could be expected that, in general, the government has low incentives to implement efficient

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policies.

Table 3.6.: Relative Marginal Effects

Model 1				Model 2			
	Mean	Mean	p-value		Mean	Mean	p-value
Women vs Men				Women vs Men			
Policy	0.1478	0.2524	0.0000	Policy	0.1448	0.2558	0.0000
Non-Policy	0.8522	0.7476	0.0000	Non-Policy	0.8552	0.7442	0.0000
Lugbara vs Other				Lugbara vs Other			
Policy	0.2693	0.1931	0.0150	Policy	0.2851	0.1918	0.0058
Non-Policy	0.7307	0.8069	0.0150	Non-Policy	0.7149	0.8082	0.0058
Muganda vs Other				Musoga vs Other			
Policy	0.1608	0.2111	0.0031	Policy	0.2736	0.1920	0.0055
Non-Policy	0.8392	0.7889	0.0031	Non-Policy	0.7264	0.8080	0.0055
Mugishu vs Other				Women Educated vs Women Uneducated			
Policy	0.2482	0.1954	0.0500	Policy	0.1916	0.1712	0.0900
Non-Policy	0.7518	0.8046	0.0500	Non-Policy	0.8084	0.8288	0.0900
Munyankole vs Other							
Policy	0.2629	0.1911	0.0035				
Non-Policy	0.7371	0.8089	0.0035				
Musoga vs Other							
Policy	0.2573	0.1935	0.0180				
Non-Policy	0.7427	0.8065	0.0180				
Women Educated vs Women Uneducated							
Policy	0.1926	0.1720	0.0780				
Non-Policy	0.8074	0.8280	0.0780				

Source: Own estimation

More in detail, it is worth looking at some differences between the groups in both models. For instance, women tend to choose more non-policy oriented than men. On the other hand, people belonging to the ethnicities Lugbara, Mugishu, Munyankole and Musoga choose more policy oriented than voters from other ethnic groups. It is also interesting to highlight that women with a higher education level tend to make their decision more policy oriented compared to the uneducated.

Governments are accountable when they implement policies that benefit all voters instead of favoring special interest of lobbying groups or intrinsic policy preferences of politicians. In order to achieve this, voters must choose more policy oriented. Based on the estimated models, accountability indices were calculated and displayed in table 3.7. The

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low results suggest that the function of elections of holding the government accountable is not fulfilled in Uganda. However, from the results we can see that men and voters from the Lugbara ethnicity hold the government more accountable than women and people from other ethnic groups.

Table 3.7.: Accountability indices

	Model 1	Model 2
Women	14.78%	14.48%
Men	25.24%	25.58%
Lugbara	26.93%	28.51%
Muganda	16.08%	
Mugishu	24.82%	
Munyankole	26.29%	
Musoga	25.73%	27.36%
Mutooro	22.70%	

Source: Own estimation

Even if a government acts accountable, elections can still be biased towards special interests. To measure the political weight of particular groups of voters, government capture indices were calculated. In table 3.8 it is clear that both models agree in the direction of capture for the groups of voters under analysis. For instance, men capture women, the Lugbara tribe captures other ethnic groups, and the same happens when looking individually at the ethnicities Mugishu, Munyankole and Musoga versus other tribes. Moreover, when comparing Musoga and Lugbara we see that the former captures the latter. Concerning the classes, class 2 captures class 1.

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Table 3.8.: Capture indices

	Model 1	Model 2
Women vs Men	0.6502	0.6474
Lugbara vs Other	1.1810	1.1997
Muganda vs Other	1.0001	
Mugishu vs Other	1.3258	
Munyankole vs Other	1.1441	
Musoga vs Other	1.2753	1.2946
Mutooro vs Other	0.9509	
Lugbara vs Musoga	0.9362	0.9371
Class 1 vs Class 2	0.5186	0.5478

Source: Own estimation

3.5. Summary and Conclusions

Uganda is a country located in East-Central Africa with a short history of democracy since it gained its independence from the UK in 1962. It is a country with a patriarchal society where women have been historically oppressed and denied opportunities of education and political participation among other rights. Likewise, there is evidence of discrimination and inequalities affecting ethnic minorities in the country. The data used in this empirical research corresponds to a survey designed by Seide (2014) that was carried out in 2013 in collaboration with Wilsken Agencies Ltd.

In our study we estimated LC models including the alternative Abstention to assess if the variables related to ethnicity and gender influence voting behavior in Uganda. The optimal estimated probabilistic voting models indicate that, policy issues, party identification and variables concerning the way the government is handling specific economic country matters had significant influence on the decision making process. Furthermore, with the latent class analysis we identified two classes of voters based on their gender and ethnic background. Our results agree with the actual 2011 presidential election outcome, where the ruling party NRM was the winner with a remarkable advantage.

Concerning the RME of the two voting motives, it is clear the wide difference between them, being the non-policy motive the highest in all scenarios. Therefore, it could be expected that the government lacks incentives to implement efficient policies. The differences between the groups in both models suggest that women in general choose more non-policy

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oriented. However, when looking at their education level, it is worth noting that educated women choose more policy oriented than the uneducated. Thus, if the level of education of women in Uganda increases, they might incentive the government to apply better policies. On the other hand, the ethnic group Lugbara, in spite of not being among the biggest ethnicities in Uganda, could motivate the incumbent to implement more efficient policies because it chooses more policy oriented, in other words, it has a higher accountability index. Nonetheless, Musoga ethnicity captures Lugbara as it has a higher political weight and therefore, it could exercise more influence in the policy-making process.

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4. Chapter

Changes in Voter Behavior after an Information Signal: An Experimental Approach for Senegal

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Abstract

Electoral competition is considered a control mechanism to guarantee a good performance of the government. However, in real life it often leads to a distorted policy implementation due to Government Capture and low Government Accountability. Therefore, the analysis of voter behavior is a key factor to understand government performance. More specifically, if voters choose more policy and retrospectively oriented, the government has greater incentives to implement efficient policies. In this sense, if voters have more information on politics, they are more likely to base their decision on policy issues. To assess changes in voter behavior, we carried out a political experiment, where information about the performance of the Senegalese government was delivered to a randomly selected group of voters. Then, based on election surveys data collected before and after the information signal, probabilistic voter models with latent class were developed. Additionally, to evaluate changes in the relative importance of the three voting motives (policy, non-policy and retrospective), marginal effects and relative marginal effects were estimated. We observed some significant changes in party choice between rounds for the positive and negative treatments. As expected, after the information signal, the relative importance of the three voting components changed significantly. Even though, we expected that the more informed voters are, the more policy oriented they would choose, in most cases, the importance of the non-policy voting motive increased, resulting in lower government accountability indices. Our findings suggest that the behavior of voters can be influenced or changed by means of information signals. However, since a clear treatment effect was not observed, future additional research is needed using a bigger sample size.

4.1. Introduction

In political theory, electoral competition is considered a control mechanism, as voters have the power to either punish the bad performance of the government or reward the good one through their vote. However, in real life, electoral processes often lead to a distorted policy implementation due to Government Capture and low Government Accountability. Therefore, the analysis of voter behavior is a key factor to understand government performance.

One of the most influential authors concerning public choice theory (Downs, 1957), states that voters evaluate candidates based on their policy platforms, as well as, on an

estimation of what such candidates would do were they in power (i.e. policy oriented). On the other hand, Grossman and Helpman (1996) affirm that voters have both, policy oriented and non-policy oriented voting motives. From their perspective, the relative importance of these voting motives depends on the level of information that voters have about politics. To elaborate further, if voters have limited information on politics by the time of casting a vote, they are likely to base their decision on non-policy issues, such as charisma or religion, giving less consideration to government policy positions. This behavior in turn, reduces the incentives for the government to implement efficient policies. Other authors also highlight the importance of information when it comes to make electoral choices. For instance, DellaVigna and Kaplan (2006) studied the impact of media bias upon voting, finding a significant effect of exposure to news on voting decision. Such exposure induced a substantial percentage of the viewers to change their decision. Pande (2011) in turn, explained that limited information is an explanation for low-quality politicians in low-income democracies. Therefore, information about the political process and politician performance improves electoral accountability. According to Coate (2004), voters update their beliefs rationally given the information they have received from advertising campaigns. Furthermore, Banerjee et al. (2011) found evidence that voters change quite substantially their electoral choice when they are given information about government performance and qualifications of the incumbent. They pointed out the fact that voters demonstrated sophistication using the information to judge performance and qualifications, as oppose to the fear that information would simply confuse them.

According to Khemani (2001), a large number of voters are motivated by party affiliation and other non-policy variables, while others that are indifferent between candidates or parties on ideological grounds, vote based on economic information (macro economic variables such as economic growth, inflation, poverty and income inequality). He interpreted voter responses to economic performance in Indian elections and argues that the evidence is consistent with greater voter vigilance and government accountability at local level. As pointed by Caplan (2007), in practice, democracies frequently adopt policies that are damaging. This is partly due to the fact that voters embrace a long list of misconceptions that lead them to act irrationally and vote accordingly. Bardhan and Mookherjee (2000) distinguish between informed and uninformed voters. Informed voters are politically aware and choose based on the utility they expect to obtain. On the contrary, uninformed voters are swayed by campaign spending. In this sense, policy biases (Government Capture)

emerge due to the existence of uninformed voters. Additionally, parties choose their policy platforms in order to maximize their probability of winning the elections.

The purpose of this paper is to see if voter behavior can be manipulated by means of information signals. To this end, we conducted a political experiment where an information signal was delivered to different groups of voters. Then, based on voter survey data collected before and after the delivery of such signal, changes in voter behavior were measured in two ways: First, probabilistic voter models were estimated to see changes in the electoral choice of voters. Here, we did not expect a strong treatment effect, since only a short informative video was shown. Second, we were also interested in measuring the changes in the relative importance of the three voting motives (policy, retrospective and non-policy) as they explained how voters make their electoral decisions. In this case, we expected that voters would start choosing more policy and retrospectively oriented after receiving the positive and negative treatments. Nevertheless, the possibility that the non-policy component increases instead, is due to the fact that this voting motive can be easily manipulated. The most recent and well known example of how data can be used to persuade and motivate voters is the data scandal of Cambridge Analytica (The CA advantage, 2018). The former British political consulting firm worked in more than 200 elections around the world, and its official site promoted its activity as a combination of predictive analytics, behavioral science and advertising technologies based on data collection.

4.2. Experimental Study

The experimental study took place in Senegal few weeks before the presidential election of February 24th, 2019. Planning the implementation of the experiment and surveys according to upcoming elections is crucial for voter behavior analysis. In this sense, we assumed that the Senegalese electorate had made up their mind for the election, which provides reliable data regarding the actual voting decision. Additionally, all political parties had chosen their policy platforms and candidates.

The experiment was carried out in five regions of Senegal. It was a random experiment as individuals were randomly assigned to different groups. It consisted of a first round of 1000 interviews, conducted face-to-face in the corresponding dialect/language (Serere, Wolof, Pular and French). The next step, was the delivery of an information signal. To this end, the total sample of interviewees was divided into three groups: group 1 received a positive treatment, group 2 received a negative treatment and group 3 received a placebo treatment.

After receiving the signal, a second round of interviews was conducted containing just some of the questions from the first round.

4.2.1. Information Signal

The tool implemented as information signal was a series of videos comprised of two parts. The first part, contained information about the role of the government and the power held by voters either to reward or punish their performance. The second part, showed the performance of the government regarding the implementation of agricultural policies in the framework of the Malabo Declaration. The aforementioned declaration is a re-commitment to the goals of the Comprehensive Africa Agriculture Development Programme (CAADP) agreed by the Heads of State and Government of the African Union to provide effective leadership for the attainment of specific goals by the year 2025. The goals include ending hunger, tripling intra-African trade in agricultural goods and services, enhancing resilience of livelihoods and production systems, and ensuring that agriculture contributes significantly to poverty reduction.

One of the Malabo strategic objectives is the Commitment to Mutual Accountability to Actions and Results, which includes a Biennial Agricultural Review Process that involves tracking, monitoring and reporting the progress. These results are then presented in individual scorecards for each country, where the performance indicators are shown. These scorecards were obtained from the Regional Strategic Analysis and Knowledge Support System (ReSAKSS) (African Union, 2018) and an example of one of them can be found in the appendix (figure 4.1).

With the information contained in these scorecards, we decided to design a traffic light rating system. This system has the advantage of being universally recognized, and using the three colors of the real traffic lights (green, yellow and red), good and poor performance can easily be identified. The table showing the scores and thresholds from which the performance is defined to be either good or bad is also available in the appendix (figure 4.2). Based on these results, we proceeded to select three good and three bad indicators of the Senegalese performance taking into account the scores of the neighbor countries.

The indicators used to deliver the signal were:

Positive indicators:

- Public expenditures in agriculture

- Strengthening social protection
- Tripling Intra-African Trade for agriculture commodities and services

Negative indicators:

- Ensuring resilience to climate related risks
- Establishing CAADP based cooperation, partnership and alliance
- Establishing Intra-African policies and institutional conditions

The information signal was exhibited as a map displaying the selected indicators of the Senegalese performance compared to the same indicators for most of the neighbor ECOWAP countries. Examples of the maps are presented in the appendix (figures 4.3 and 4.4).

As regards the placebo video, it was not related to the agricultural policy implementation, but instead it was a short documentary about the process of desertification in Senegal. In the video, rural communities receive training on planting patterns to enrich the soil and stop the desertification process. Unlike the other videos, the idea was not to change the opinion of the audience about the performance of the government in the agricultural sector (Elsen, 2016).

4.3. Methodology

4.3.1. Voter Behavior

To analyze voter behavior we estimated a probabilistic voter model that makes possible the inclusion, in the utility function, of a stochastic term containing all unknown factors. These models are usually estimated with Discrete Choice models, as they can explain choices between two or more alternatives. In this study, the alternative Abstention was also included in the choice set.

To derive the Discrete Choice model, it is common to apply a Random Utility Maximization (RUM) Model. Here, if voter i decides to participate in the election, he chooses party k only if this party provides him the highest utility V_{ik} . Similarly, if the voter chooses not to participate, the greater utility comes from the alternative Abstention. Also, we assume that the stochastic term is independently, identically extreme value distributed (iid) and thus a logit model was derived. This model was extended to a multi-alternative estimation

based on McFadden (1974), meaning that voters can choose an alternative k from a set of alternatives K .

$$P_{ik}(K) = \frac{e^{V_{ik}}}{\sum_{k=1}^K e^{V_{ik}}} \quad (4.1)$$

Given the nature of the experiment, we first created two datasets. Both of them contain all variables that did not change from round 1 to round 2, such as, the socio-demographic characteristics. Additionally, each dataset includes those variables built from questions asked in both rounds, like, distances, choice, satisfaction with president and satisfaction with policy. The next step was to divide them according to the type of treatment (positive, negative and placebo) resulting in six datasets. Finally, in order to perform the estimations, they were transformed into long datasets.

In a long format dataset the number of observations for each voter depends on the number of alternatives (K). Additionally, the dependent variable *Choice* equals 1 if an alternative is chosen and 0 otherwise. Furthermore, individual specific variables are different for every voter/alternative combination. On the contrary, alternative specific variables vary across alternatives.

The logit model estimated in this paper includes three components or voting motives: non-policy oriented (V_{ik}^{NP}), policy oriented (V_{ik}^P) and retrospectively oriented (V_{ik}^R). The voter's utility function is as follows:

$$V_{ik} = V_{ik}^{NP} + V_{ik}^P + V_{ik}^R \quad (4.2)$$

When voters are not well informed and aware of policies, they might apply non-policy indicators to estimate their expected utility. These indicators might be their socio-demographic characteristics x_{ij} , as well as, the concept of valence (Schofield, 2007), where voters perceive a specific competence of candidates based on specific characteristics z_i , like charisma and appearance. In addition, party identification works as an intensifier in the favoritism towards a candidate from the preferred political party, and therefore, it has been included in the utility function of the voter by several authors such as Erikson and Romero (1990); Adams (2001) and Adams et al. (2005).

$$V_{ik}^{NP} = \sum_j^J \alpha_{kj} x_{ij} + \alpha_k z_i + \alpha P I_{ik} \quad (4.3)$$

On the other hand, the policy oriented voter's utility function is calculated based on the spatial voting model (Davis et al., 1970; Enelow and Hinich, 1984), as the weighted distance between a voter's position x_{di} on a specific issue d and the perceived position taken by the party or candidate y_{dik} on the same issue:

$$V_{ik}^P = -\sum_d^D \beta_d (y_{dik} - x_{di})^2 \quad (4.4)$$

The coefficient β is always negative, because the greater the distance between the voter's position and the party/candidate's position, the less is the utility. In the case of the alternative Abstention, the distance was set to 0. Therefore, the utility of non-voting is greater than the utility of voting and hence the voting paradox is fulfilled.

As regards the retrospective voting motive (Fiorina, 1981), voters can express a general assessment of the past performance of a party/candidate or the government. In this sense, voters use observable welfare indicators Z_{ir} which are determined by governmental policies (γ_G).

$$V_{ik}^R = \sum_r^R \delta_{kr} Z_{ir} (\gamma_G) \quad (4.5)$$

This model assumes that all voters act homogeneously. However, since we are also interested in analyzing the impact of voter behavior on government performance, heterogeneity must be allowed. Therefore, this model needs to be extended to a latent class model, where the probability that voter i chooses party k is class-specific (c).

$$P_{ikc} = \frac{e^{V_{ikc}}}{\sum_{k=1}^K e^{V_{ikc}}} \text{ where } V_{ikc} = V_{ikc}^{NP} + V_{ikc}^P + V_{ikc}^R \quad (4.6)$$

To generate the classes, individual characteristics of the voters were used. We refer to the vector containing these characteristics as covariates. To determine the class-specific utility v_{ic} and the probability of class membership p_{ic} , the following formulas were applied:

$$v_{ic} = \alpha_c + \sum_j^J b_{cj} x_{ij} \quad (4.7)$$

and

$$p_{ic} = \frac{e^{v_{ic}}}{\sum_{c=1}^C e^{v_{ic}}} \quad (4.8)$$

where α_c is the class intercept, b_{cj} are the class-specific coefficients and x_{ij} are the individual characteristics of the voters.

Then, to calculate the probability that voter i chooses alternative k , one has to weight the probability that voter i chooses alternative k given that he belongs to class c (P_{ikc}) with the probability that voter i actually belongs to class c (p_{ic}):

$$\bar{P}_{ik} = \sum_c P_{ikc} * p_{ic} \quad (4.9)$$

4.3.2. Government Performance

To measure voter behavior and assess government performance, marginal effects and relative marginal effects were calculated for both rounds and for each type of treatment.

For the generic coefficient variables, the marginal effects were calculated as follows:

- For the distances:

$$ME_{ic}^P = \frac{\partial P_{ikc}}{\partial D_{dik}} = |P_{ikc} (1 - P_{ikc}) \beta_d| \text{ where } D_{dik} = (y_{dik} - x_{di}) \quad (4.10)$$

- For party identification:

$$ME_{ic}^{NP} = \frac{\partial P_{ikc}}{\partial PI_{ik}} = |P_{ikc} (1 - P_{ikc}) \alpha| \quad (4.11)$$

For the alternative specific coefficient variables, the marginal effects were calculated as follows:

$$ME_{ic}^R = \frac{\partial P_{ikc}}{\partial Z_{ir}(\gamma_G)} = \left| P_{ikc} \left(\delta_{kG} - \sum_{k=1}^K \delta_{kr} P_{ikc} \right) \right| \quad (4.12)$$

These show how the probability P_{ikc} changes when there is a one unit change in the independent variables. In other words, they indicate how sensitive voters are to changes in non-policy, policy and retrospective components. The results are in absolute values because we were interested in evaluating the magnitude of the impact rather than the direction.

To evaluate the relative importance of the different voting motives, the relative marginal effects (RME) were calculated for each voter i :

$$RME_i^{NP} = \frac{ME_i^{NP}}{ME_i^{NP} + ME_i^P + ME_i^R} \quad (4.13)$$

$$RME_i^P = \frac{ME_i^P}{ME_i^{NP} + ME_i^P + ME_i^R} \quad (4.14)$$

$$RME_i^R = \frac{ME_i^R}{ME_i^{NP} + ME_i^P + ME_i^R} \quad (4.15)$$

Government Accountability

In democratic systems, the function of accountability implies that electoral processes serve as control mechanisms. Therefore, electoral competition should encourage governments to develop and implement efficient policies. In this sense, we assumed that government accountability is low when voters choose more non-policy oriented and viceversa. Thus, based on the RME we derived a government accountability index (GA).

$$RME^{NP} = \sum_{i=1}^n RME_i^{NP} \quad (4.16)$$

$$RME^P = \sum_{i=1}^n RME_i^P \quad (4.17)$$

$$RME^R = \sum_{i=1}^n RME_i^R \quad (4.18)$$

$$GA = \frac{RME^P + RME^R}{RME^{NP} + RME^P + RME^R} \quad (4.19)$$

where the policy and retrospective components are added up in order to compare policy vs. non-policy voting motives.

4.3.3. Treatment Effect

The treatment effect is measured to compare the impact of different treatments on randomized experimental studies like ours. More specifically, the treatment effect measures the difference in outcomes between treated groups and untreated groups. In our case, we measured the impact of a positive and a negative information signal by comparing the outcomes before and after the treatments. In this sense, we expect both treatments to have an effect on people's voting choices, as well as on how they make their electoral decisions. In the case of the placebo treatment, no changes were expected. In order to observe the changes between rounds we estimated probabilistic voter models and relative marginal effects for each round and type of treatment as they describe voter behavior. Since we do not expect the treatment effect for each individual to be constant across all voters, the average treatment effect (ATE) was estimated as:

- For the voting choice:

$$ATE_{P_{ik}} = \frac{1}{N} \sum_i (P_{ik2} - P_{ik1}) \quad (4.20)$$

- For the relative marginal effects:

$$ATE_{RME_i^{NP}} = \frac{1}{N} \sum_i (RME_{i2}^{NP} - RME_{i1}^{NP}) \quad (4.21)$$

$$ATE_{RME_i^P} = \frac{1}{N} \sum_i (RME_{i2}^P - RME_{i1}^P) \quad (4.22)$$

$$ATE_{RME_i^R} = \frac{1}{N} \sum_i (RME_{i2}^R - RME_{i1}^R) \quad (4.23)$$

Then, based on the endogenous switching regression (ESR) model approach applied by (Abdulai, 2016), the impact of the treatments on voting behavior is measured by estimating the counterfactual effect on the RMEs. More specifically, we estimated how voters would have behaved if they had received a different treatment. That is, for each treatment group, the RMEs were estimated for the other two regimes. For example, we estimated how would voters in the positive treatment group would have behaved, if they had been negatively treated, as well as if they had seen the placebo video. Then, we compared the behavior of voters under one regime (positive) with the behavior under the other regimes (negative

and placebo).

4.4. Data

We designed two rounds of voter surveys including questions on socio-demographic characteristics, voting behavior, policy positions and network characteristics. The first and second round of interviews were applied in Senegal on the same day in January 2019 by the Senegalese Agricultural Research Institute. These were conducted face-to-face in the respective dialect or language of the interviewees. The sample contains 1000 individuals from five different regions across the country. After data cleaning, 844 complete observations remained for the analysis of voters' behavior. The observations with missing values in the variables choice-pre and choice-post were eliminated.

4.4.1. Dependent Variable

In a probabilistic voter model the dependent variable is usually the actual or intended vote choice. Given the approach of this paper, the interviewees had to answer, in both rounds, to the following question:

If a presidential election were held tomorrow, which party would you vote for?

To include the alternative Abstention, we followed the approach of Thurner and Eyermann (2000). They explain that the number of people who decide not to participate in an election is usually underestimated in surveys due to effects of social (un)desirability. Therefore, we have considered the interviewees who revealed their intention of abstaining, as well as, the potential non-voters. In other words, we have taken into account those respondents who answered "Will not vote" and "Don't know" as part of the Abstention alternative.

Table 4.1 shows the results of both surveys, as well as, the official presidential election outcome. Even though none of the surveys' results are close to the actual election outcome, the party in power BBY is a clear winner. For the analysis in the empirical section we consider all parties and Abstention. Then, the whole set of alternatives is: $K = \{\text{BBY, Rewmi, Pastef, PUR, Niang and Abstention}\}$.

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Table 4.1.: Senegalese presidential election results

	BBY	Rewmi	Pastef	PUR	Niang	Abstention
Presidential election 2019	38.48%	13.55%	10.35%	2.69%	0.98%	33.95%
Own survey 2019 (First round)	70.46%	3.72%	5.30%	1.13%	0.34%	19.05%
Own survey 2019 (Second round)	73.53%	3.96%	5.32%	1.02%	0.34%	15.84%

Source: (Constitutional Council of Senegal, 2019), own survey

4.4.2. Independent Variables

To explain the dependent variable, only independent variables with less than 10% of missing values were considered. Furthermore, the variables with missing values were imputed with the mean value, except for the policy positions that were imputed via linear regressions. For this study, they were divided into policy, retrospective and non-policy.

Policy Variables: Respondents were asked about their policy positions and their perceived policy positions of the parties on nine different issues. The positions were asked, based on a five-point scale, on the following issues:

1. Social
2. Ideology
3. Investment in: Public services vs. Economic growth (PSvsEG)
4. Investment in: Education and health services vs. Insecurity and violence reduction (EHvsIV)
5. Development of: Agricultural sector vs. Industrial sector (AGRvsIND)
6. Increase productivity of: Food crops vs. Cash crops (FoodvsCash)
7. Benefit the agricultural sector through: Technological progress vs. Access to markets (TPvsAM)
8. Agricultural sector should be: Taxed vs. Protected (TaxvsProtect)
9. Accountability

Then, distances for the parties were calculated as the difference between the voters' own policy position and the perceived policy position of the parties. In the case of the alternative Abstention, the distance was set to 0. Therefore, the utility of non-voting is greater than the utility of voting and hence the voting paradox is fulfilled.

Retrospective Variables: Questions of satisfaction with government performance were asked in both rounds. More specifically, there were questions addressing the level of satisfaction with the performance of the current president, as well as, the implementation of agricultural policies by the government.

Non-policy Variables: A whole set of sociodemographic variables such as gender, rurality, marital status and education was included, as well as, other variables measuring the level of trust of voters on different types of institutions. Moreover, regions and ethnic groups were coded as dummy variables. Furthermore, to measure party loyalty, the variables Party ID were created as alternative specific dummies, where "1" indicates party affiliation for that specific party and "0" otherwise. In the case of the alternative Abstention, the variable was set to "0" since there is no such thing as party identification for Abstention. Additionally, we created the dummy variables "positive", "negative" and "placebo" regarding the type of treatment.

4.5. Empirical Application and Results

4.5.1. Differences in Voting Choice

Before assessing the impact of the information signal on the behavior of voters, it was important to observe if there were changes in the variable party choice between the rounds. To this end, we performed a simple sample comparison and the results are displayed in table 4.2. Despite not observing changes of great magnitude, we were in fact able to identify some changes from one round to the next in the electoral decision.

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Table 4.2.: Differences in Choice

TYPE OF TREATMENT	CHOICE		% OF VOTERS
	Round 1	Round 2	
Positive	Abstention	BBY	3.57%
	Abstention	Pastef	0.36%
	BBY	Abstention	2.14%
	BBY	Pastef	0.36%
	Pastef	Abstention	0.36%
	Pastef	BBY	0.36%
	PUR	Rewmi	0.36%
	Changes		7.50%
	No Change		92.50%
	Total		100%
Negative	Abstention	BBY	4.32%
	Abstention	Rewmi	0.36%
	BBY	Abstention	1.44%
	BBY	Pastef	0.36%
	BBY	Rewmi	0.36%
	Pastef	Abstention	0.36%
	Pastef	BBY	0.36%
	Changes		7.55%
	No Change		92.45%
	Total		100%
Placebo	Abstention	BBY	3.50%
	Abstention	Pastef	0.35%
	Abstention	Rewmi	0.35%
	BBY	Abstention	2.45%
	Rewmi	Abstention	0.35%
	Changes		6.99%
	No Change		93.01%
	Total		100%

Source: Own estimation

4.5.2. Probabilistic Voter Model

With the data described in the former section, we estimated probabilistic voter models with latent class to determine which factors influence voting behavior in Senegal. This latent class model (LCM) approach takes into account the heterogeneity of the data, which is relevant because voting motives differ across voters. The estimated LCMs consist of two sub-models, the model for choices that determines which alternative is chosen and the model for classes that defines class membership.

Different model specifications were estimated, where the incumbent (BBY) was taken as the reference party and the goodness of fit was measured with the Akaike Information Criterion (AIC). The models included only the independent variables that were significant for at least one class or alternative and the level of significant was determined by the z-scores. The results of the estimated models for each treatment and round are displayed in tables 4.3 to 4.8

Among the attributes are the alternative specific constants, that absorb all information not explicitly incorporated in the models. Also included, is the policy issue FoodvsCash, which is significant with negative coefficients for at least one class. This means that the greater the distance between the voter's position and the perceived position of the party, the less is the utility and the probability to choose that party. In the case of the alternative Abstention, the utility of non-voting is always greater than the utility of voting, which is consistent with the voting paradox. The last attribute was Party Identification, that turned out to be significant with positive coefficients. This means that if a voter feels close to a political party, the probability that he will choose the corresponding candidate increases. On the other hand, those voters not close to any political party, do not increase their utility by casting a vote for any candidate, hence, they rather abstain. As regards the predictors, the variable Satisfaction with Policy was significant in most cases with negative coefficients. This is consistent with the theory, as the greater the satisfaction with the agricultural policies implemented by the government, the less is the probability to either abstain or support an opposition party in the elections with respect to the reference party BBY. Concerning the covariates, the intercepts when significant, have a positive sign, which reflects the existence of bias towards belonging to class 2. On the other hand, the probability of belonging to class 1 increases when voters trust the president. The size of the class memberships indicates a stronger heterogeneity in the first round regardless the treatment.

Finally, we estimated the utilities and probabilities. Table 4.9 shows the mean probabilities per type of treatment for each alternative and round, as well as the t-test to evaluate the significance in the changes. As expected, the changes in the placebo treatment were not significant. On the other hand, even though we could observe some significant changes for the positive and negative treatments, we expected to find a more significant treatment effect in these groups of voters.

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Table 4.3.: Latent Class Model for the Positive Treatment (First Round)

		AIC = 350.1374	Class 1 (0.6916)		Class 2 (0.3084)			
VARIABLES		Coeff.	z-value	Coeff.	z-value			
Model for Choices	<i>Attributes</i>	Abstention:(intercept)	-28.0048	-1.6070	5.0021	2.0712	*	
		Niang:(intercept)	-11.9297	-0.1796	-0.2260	-0.0623		
		Pastef:(intercept)	-14.8721	-1.1593	4.2105	1.7042		
		PUR:(intercept)	4.4638	0.2222	-5.7438	-0.0858		
		Rewmi:(intercept)	-13.9236	-1.5827	5.8809	1.8498		
		FoodvsCash	-0.5762	-1.8774	.	-0.1628	-1.4142	
		Party_ID	19.4878	2.3728	*	3.3867	4.2309	
	<i>Predictors</i>	Abstention:Satisfaction_with_policy	5.5859	1.3854	-1.4345	-2.1160		
		Niang:Satisfaction_with_policy	-0.9990	-0.0408	-0.6138	-0.5401		
		Pastef:Satisfaction_with_policy	0.5395	0.0840	-1.7888	-2.2538		
PUR:Satisfaction_with_policy		-9.0057	-0.4491	-1.0381	-0.0414			
Rewmi:Satisfaction_with_policy		0.7942	0.2593	-3.7420	-1.9070			
Model for Classes	<i>Covariates</i>	classes:intercept	0.0000		1.4665	2.3649		
		classes:Trust_president	0.0000		-0.7292	-3.3617		

***p<0.001, **p<0.01, *p<0.05, . p<0.10

Source: Own estimation

Table 4.4.: Latent Class Model for the Positive Treatment (Second Round)

		AIC = 328.4950	Class 1 (0.8672)		Class 2 (0.1328)			
VARIABLES		Coeff.	z-value	Coeff.	z-value			
Model for Choices	<i>Attributes</i>	Abstention:(intercept)	-0.5549	-0.5720	12.8245	1.6605		
		Niang:(intercept)	-2.5003	-1.0320	8.5880	0.9103		
		Pastef:(intercept)	0.0405	0.0377	10.6478	1.3652		
		PUR:(intercept)	-33.5941	-0.0336	-20.9392	-0.0209		
		Rewmi:(intercept)	-1.8263	-0.2638	10.7968	1.3838		
		FoodvsCash	-0.1088	-1.7790	.	-0.0192	-0.0990	
		Party_ID	9.8037	2.1204	*	6.1356	2.2785	
	<i>Predictors</i>	Abstention:Satisfaction_with_policy	-0.6534	-1.7014	.	-2.3176	-1.0046	
		Niang:Satisfaction_with_policy	-0.9534	-0.9056		-2.6379	-0.7718	
		Pastef:Satisfaction_with_policy	-1.3744	-2.6146	**	-3.1005	-1.1130	
PUR:Satisfaction_with_policy		-0.2876	-0.0003		-1.9277	-0.0019		
Rewmi:Satisfaction_with_policy		-3.7629	-0.7169		-2.3361	-0.9858		
Model for Classes	<i>Covariates</i>	classes:intercept	0.0000		0.6154	0.7479		
		classes:Trust_president	0.0000		-0.8530	-2.7368		

***p<0.001, **p<0.01, *p<0.05, . p<0.10

Source: Own estimation

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Table 4.5.: Latent Class Model for the Negative Treatment (First Round)

		AIC = 343.4448	Class 1 (0.7566)		Class 2 (0.2434)		
		VARIABLES	Coeff.	z-value	Coeff.	z-value	
Model for Choices	<i>Attributes</i>	Abstention:(intercept)	1.3432	1.1547	1.1860	0.6369	
		Niang:(intercept)	-33.1889	-0.0332	-31.9601	0.0320	
		Pastef:(intercept)	1.3660	0.2482	1.9730	0.9469	
		PUR:(intercept)	-4.7147	-1.7477	-4.1422	0.6966	
		Rewmi:(intercept)	-11.4728	-1.2394	1.2278	0.6290	
		FoodvsCash	-0.0208	-0.2242	-0.2093	-1.6844	
		Party_ID	9.5118	1.5508	4.4389	3.5983	***
	<i>Predictors</i>	Abstention:Satisfaction_with_policy	-1.3016	-2.0314	*	0.6665	0.9562
		Niang:Satisfaction_with_policy	-0.3730	-0.0004		0.8985	0.0009
		Pastef:Satisfaction_with_policy	-3.8308	-0.7997		-0.5194	-0.4962
PUR:Satisfaction_with_policy		0.2565	0.3050		1.1221	0.5445	
Rewmi:Satisfaction_with_policy		1.4684	0.6392		-0.0017	-0.0020	
Model for Classes	<i>Covariates</i>	classes:intercept	0.0000		3.5690	2.9553	**
		classes:Trust_president	0.0000		-1.5622	-3.6289	***

***p<0.001, **p<0.01, *p<0.05, . p<0.10

Source: Own estimation

Table 4.6.: Latent Class Model for the Negative Treatment (Second Round)

		AIC = 348.1161	Class 1 (0.7971)		Class 2 (0.2029)		
		VARIABLES	Coeff.	z-value	Coeff.	z-value	
Model for Choices	<i>Attributes</i>	Abstention:(intercept)	-0.0931	-0.1111	3.0754	1.1024	
		Niang:(intercept)	-33.6527	-0.0337	-29.8319	-0.0298	
		Pastef:(intercept)	-21.0848	-1.9297	3.5337	1.2595	
		PUR:(intercept)	-5.4746	-1.9179	0.7326	0.0493	
		Rewmi:(intercept)	0.7862	0.0904	2.9150	1.0714	
		FoodvsCash	-0.1643	-2.3287	*	-0.1132	-1.1549
		Party_ID	16.2527	2.2234	*	5.0404	2.3044
	<i>Predictors</i>	Abstention:Satisfaction_with_policy	-0.8615	-2.2161	*	0.1975	0.3110
		Niang:Satisfaction_with_policy	-0.2577	-0.0003		0.4135	0.0004
		Pastef:Satisfaction_with_policy	3.8806	1.4186		-0.5003	-0.6225
PUR:Satisfaction_with_policy		0.5303	0.5775		-1.7380	-0.1373	
Rewmi:Satisfaction_with_policy		-6.9240	-1.4292		-0.1929	-0.2589	
Model for Classes	<i>Covariates</i>	classes:intercept	0.0000		2.2317	2.5886	**
		classes:Trust_president	0.0000		-1.2084	-4.0667	***

***p<0.001, **p<0.01, *p<0.05, . p<0.10

Source: Own estimation

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Table 4.7.: Latent Class Model for the Placebo Treatment (First Round)

		AIC = 354.2047	Class 1 (0.7700)		Class 2 (0.2300)			
VARIABLES		Coeff.	z-value	Coeff.	z-value			
Model for Choices	<i>Attributes</i>	Abstention:(intercept)	0.8065	0.7380	-4.0138	-1.7303	.	
		Niang:(intercept)	-32.9206	-0.0329	-37.2921	-0.0373		
		Pastef:(intercept)	-13.4889	-1.6729	-5.2657	-2.1514	*	
		PUR:(intercept)	-4.9704	-0.5027	-5.7268	-2.1734	*	
		Rewmi:(intercept)	-1.0820	-0.7038	-15.0888	-1.4605		
		FoodvsCash	-0.3499	-2.7995	**	0.0266	0.3363	
		Party_ID	11.9602	2.1782	*	7.1401	2.3652	*
	<i>Predictors</i>	Abstention:Satisfaction_with_policy	-1.4353	-2.3725	*	4.0074	2.1972	*
		Niang:Satisfaction_with_policy	-0.6154	-0.0006		3.9924	0.0040	
		Pastef:Satisfaction_with_policy	1.3358	0.5546		3.4288	1.8191	.
PUR:Satisfaction_with_policy		-0.8757	-0.2848		3.4245	1.7713	.	
Rewmi:Satisfaction_with_policy		-1.0974	-1.5944		5.6686	1.4737		
Model for Classes	<i>Covariates</i>	classes:intercept	0.0000		1.7776	2.3695	*	
		classes:Trust_president	0.0000		-1.0106	-4.2637	***	

***p<0.001, **p<0.01, *p<0.05, . p<0.10

Source: Own estimation

Table 4.8.: Latent Class Model for the Placebo Treatment (Second Round)

		AIC = 360.0985	Class 1 (0.7836)		Class 2 (0.2164)			
VARIABLES		Coeff.	z-value	Coeff.	z-value			
Model for Choices	<i>Attributes</i>	Abstention:(intercept)	2.2725	1.7718	.	-3.7515	-1.7378	.
		Niang:(intercept)	-33.1219	-0.0331		-36.3578	-0.0364	
		Pastef:(intercept)	-10.5562	-1.4847		-4.6760	-2.0574	*
		PUR:(intercept)	-3.6418	-1.1173		-5.4946	-1.5683	
		Rewmi:(intercept)	-14.6343	-1.7327	.	-4.1047	-1.7511	.
		FoodvsCash	0.0438	0.5060		-0.3476	-1.7836	.
		Party_ID	12.4323	2.0362	*	5.9033	3.2922	***
	<i>Predictors</i>	Abstention:Satisfaction_with_policy	-1.7376	-2.5225	*	3.1256	2.6631	**
		Niang:Satisfaction_with_policy	-0.4990	-0.0005		3.1734	0.0032	
		Pastef:Satisfaction_with_policy	-0.5765	-0.2455		2.8893	2.3224	*
PUR:Satisfaction_with_policy		-0.3651	-0.3571		2.5570	1.5185		
Rewmi:Satisfaction_with_policy		2.0033	1.0053		2.4966	1.9110	.	
Model for Classes	<i>Covariates</i>	classes:intercept	0.0000		1.2977	1.6230		
		classes:Trust_president	0.0000		-0.8719	-3.8335	***	

***p<0.001, **p<0.01, *p<0.05, . p<0.10

Source: Own estimation

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Table 4.9.: Mean Probabilities

Positive Treatment			
	Round 1	Round 2	t-test
Abstention	16.20%	14.96%	0.2537
BBY	74.46%	75.68%	0.5683
Niang	1.00%	1.06%	0.9140
Pastef	5.74%	5.72%	0.9862
PUR	0.56%	0.00%	0.0400
Rewmi	2.03%	2.57%	0.5229
	100.00%	100.00%	

Negative Treatment			
	Round 1	Round 2	t-test
Abstention	18.53%	15.79%	0.0695
BBY	69.69%	72.15%	0.3317
Niang	0.00%	0.00%	0.9613
Pastef	5.48%	4.90%	0.6671
PUR	1.04%	1.06%	0.9759
Rewmi	5.26%	6.10%	0.5659
	100.00%	100.00%	

Placebo Treatment			
	Round 1	Round 2	t-test
Abstention	19.99%	18.52%	0.3071
BBY	70.89%	72.24%	0.5477
Niang	0.00%	0.00%	0.7728
Pastef	3.79%	4.09%	0.8032
PUR	1.73%	1.69%	0.9632
Rewmi	3.61%	3.46%	0.8928
	100.00%	100.00%	

Source: Own estimation

4.5.3. Voting Behavior and Government Performance

Although the treatment effects seem to be weak when analyzing the changes in the probabilities, what it is more relevant to us is voter behavior, that is, how voters make their electoral decision. For this purpose, relative marginal effects and the corresponding t-tests were estimated and the results are displayed in table 4.10. Here, it can be observed that the changes from round 1 to round 2 were significant, hence, there was a treatment effect. Nevertheless, the impact is not what we expected as the non-policy component increased in both cases, whereas the policy and retrospecting voting motives decreased, resulting also in lower government accountability indices.

Table 4.10.: Relative Marginal Effects

Positive Treatment			
	Round 1	Round 2	t-test
Pol	3.11%	0.75%	0.0000
Retro	26.85%	14.46%	0.0000
Non-Pol	70.04%	84.79%	0.0000
	100.00%	100.00%	
GA Index	29.96%	15.21%	
Negative Treatment			
	Round 1	Round 2	t-test
Pol	1.86%	1.44%	0.0003
Retro	9.16%	3.65%	0.0000
Non-Pol	88.99%	94.91%	0.0000
	100.00%	100.00%	
GA Index	11.01%	5.09%	

Source: Own estimation

Then, when assessing the impact of the treatments on voting behavior by means of the counterfactual relative marginal effects, we identified a clear pattern. More specifically, for the positively treated group, a more non-policy oriented voting behavior was generated,

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whereas the negatively treated voters had a more policy oriented tendency. Consequently, the government accountability index decreased for the former and increased for the latter.

Table 4.11.: Counterfactual Relative Marginal Effects

Positive Treatment				Positive Treatment			
	Round 1 (Positive)	Round 2 (Negative)	t-test		Round 1 (Positive)	Round 2 (Placebo)	t-test
Pol	3.11%	1.37%	0.0000	Pol	3.11%	1.44%	0.0000
Retro	26.85%	3.02%	0.0000	Retro	26.85%	16.43%	0.0000
Non-Pol	70.04%	95.61%	0.0000	Non-Pol	70.04%	82.12%	0.0000
	100.00%	100.00%			100.00%	100.00%	
GA Index	29.96%	4.39%		GA Index	29.96%	17.88%	

Negative Treatment				Negative Treatment			
	Round 1 (Negative)	Round 2 (Positive)	t-test		Round 1 (Negative)	Round 2 (Placebo)	t-test
Pol	1.86%	0.71%	0.0000	Pol	1.86%	1.59%	0.0700
Retro	9.16%	15.88%	0.0000	Retro	9.16%	17.51%	0.0000
Non-Pol	88.99%	83.40%	0.0000	Non-Pol	88.99%	80.90%	0.0000
	100.00%	100.00%			100.00%	100.00%	
GA Index	11.01%	16.60%		GA Index	11.01%	19.10%	

Source: Own estimation

4.6. Summary and Conclusions

Senegal is a republic with a presidential system. The country has been considered for long as one of Africa's model democracies with a tradition of stable governments and civilian rule. There are more than 80 political parties and the unicameral National Assembly has 150 members elected separately from the President. Presidential elections are carried out every five years and the main political parties are the ruling coalition Benno Bok Yakaar (BBY), Rewmi, the Party of Senegal for work, ethics and fraternity (Pastef) and the Party of Unity and Rally (PUR). By the time the data was collected in February 2019, the president Macky Sall was running for reelection.

In this study, we performed a random experiment to deliver information to a group of voters in Senegal prior to the presidential election. The experiment comprised a series of videos containing information about the performance of the government in the agricultural sector. With the data collected from the experimental study, we proceeded to estimate

probabilistic voter models with latent class for each round and type of treatment to determine which factors influence and change voting behavior in Senegal. With this approach we took into account the heterogeneity of the data, as voting motives differ across voters. The Latent Class Model (LCM) allowed us to determine which alternative is chosen, as well as, to identify two classes of voters for each model, based on their individual characteristics. In the optimal models, policy, non-policy and retrospective variables had a significant influence when making the decision. Probabilities were calculated for each alternative, round and type of treatment. In all cases our surveys showed that the highest probability of being elected was for the ruling party (BBY). Although, our estimations differ in terms of proportions compared to the official electoral outcome, they are consistent with the actual results. We also observed some significant changes in party choice between rounds for the positive and negative treatments. However, as expected, the impact seemed to be weak due to an inadequate sampling. In order to obtain a more significant effect a bigger sample size is required.

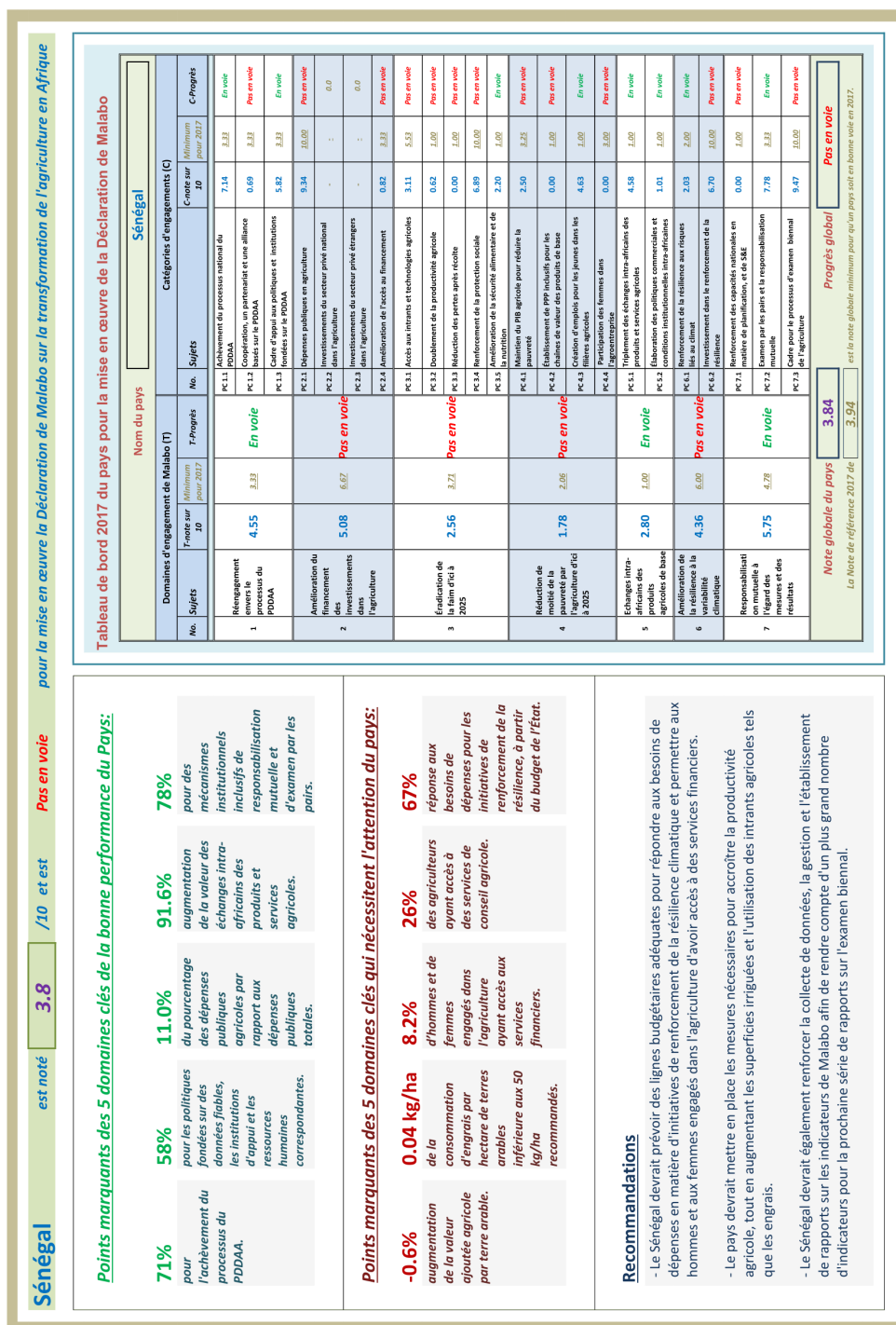
With respect to the relative marginal effects (RMEs) of the three voting motives, the non-policy component is always the most important motive. Also, the information signal did generate changes in voting behavior for all components. In this sense, we expected that the more informed voters are, the more policy oriented, compared to non-policy, they would choose (being the policy component the sum of policy and retrospective voting motives). Nevertheless, in most cases, the importance of the non-policy voting motive increased, resulting in lower government accountability indices. This implies that the electorate in Senegal do not hold accountable the government. The higher importance of the non-policy component after voters received the treatments could be interpreted like the information signal was rather a general shock that put the government party in the mind of people. Then, the proverbial expression "There is no such thing as bad publicity" would make sense.

From these results we concluded that the behavior of voters can be influenced or changed by means of information signals. Thus, this can be considered a good methodological design to measure the impact of an information signal on voter behavior and government performance. However, since the resulting effect on party choice was relatively weak and in most cases the non-policy component increased, we could not identify a clear treatment effect. Therefore, future additional research is needed using a bigger sample size.

4. Changes in Voter Behavior after an Information Signal: An Experimental Approach for Senegal

Appendix

Figure 4.1.: Senegal Scorecard



Source: (African Union, 2018)

4. Changes in Voter Behavior after an Information Signal: An Experimental Approach
for Senegal

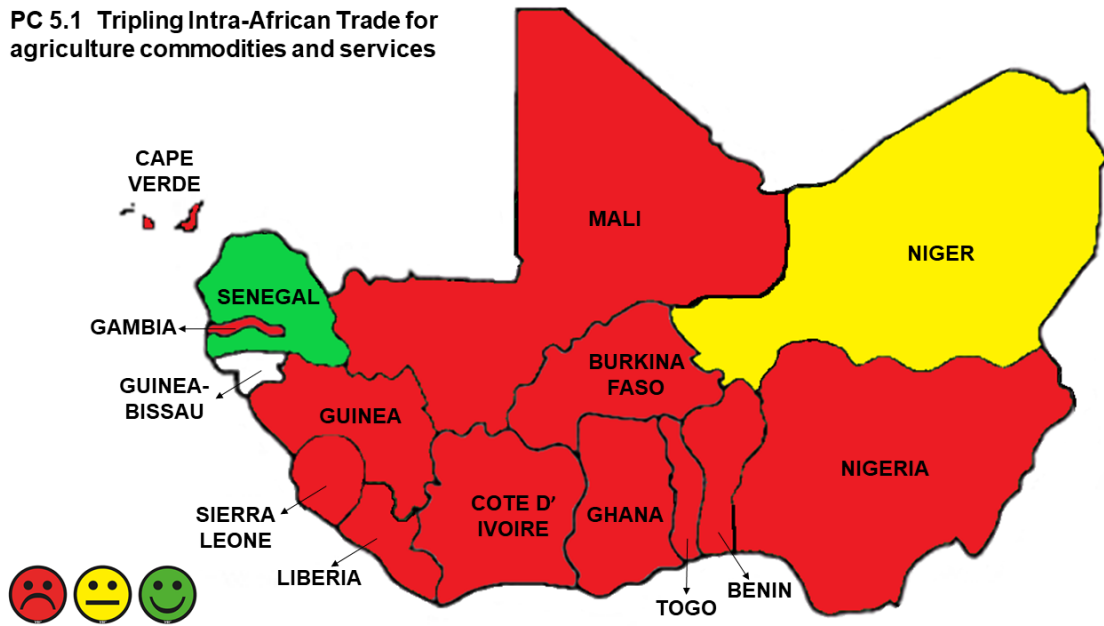
Figure 4.2.: Indicators' scores and thresholds

	BENIN	BURKINA FASO	CAPE VERDE	COTE D'IVOIRE	GAMBIA	GHANA	GUINEA	GUINEA-BISSAU	LIBERIA	MALI	NIGER	NIGERIA	SENEGAL	SIERRA LEONE	TOGO
1.1	8.57	4.29	7.14	10.00	7.14	5.71	7.14		5.71	8.79	10.00	4.29	7.14	5.71	10.00
1.2	7.88	6.49	7.02	5.76	4.61	6.15	3.30		0.74	4.80	9.20	8.67	0.68	0.88	7.77
1.3	8.08	6.11	3.55	9.84	5.95	8.79	6.72		5.14	10.00	6.67	6.67	5.82	0.00	6.85
2.1	5.24	7.46	7.41	3.19	3.51	8.65	4.20		0.00	4.52	4.25	4.23	9.34	3.17	6.26
2.2															
2.3															
2.4	0.88	0.37	0.00	0.50	0.00	0.00	0.00		0.00	0.70	0.00	5.96	0.82	0.42	4.02
3.1	2.79	5.21	4.96	2.44	4.89	5.90	3.27		0.10	4.56	0.29	0.57	3.11	3.31	3.54
3.2	2.16	0.08	0.00	1.10	0.29	0.72	0.84		0.00	0.88	0.58	0.13	0.62	0.48	0.50
3.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	1.76
3.4	8.81	3.40	1.44	0.80	0.00	0.00	2.41		0.00	10.00	0.00	1.40	6.89	0.00	0.00
3.5	1.67	2.40	0.00	2.01	0.68	3.33	0.06		0.00	2.67	3.22	0.00	2.20	0.00	0.87
4.1	3.12	4.61	1.19	2.62	0.00	2.07	1.22		0.00	3.00	2.80	0.00	2.50	1.60	2.58
4.2	0.00	0.00	10.00	10.00	0.00	10.00	0.00		0.00	10.00	0.00	0.00	0.00	0.00	0.00
4.3	0.00	0.00	6.33	0.00	10.00	0.00	0.00		0.00	10.00	1.00	0.00	4.63	10.00	0.00
4.4	1.64	10.00	0.00	4.37	0.00	0.00	0.26		0.00	0.00	0.00	0.00	0.00	0.00	6.43
5.1	0.15	0.10	0.00	0.00	0.00	0.00	0.00		0.00	0.65	1.88	0.67	4.58	0.00	0.00
5.2	6.88	6.89	8.20	0.00	7.08	2.22	6.74		0.00	7.15	5.00	6.81	1.01	0.00	8.31
6.1	0.09	3.78	8.33	0.10	1.17	0.04	9.21		0.00	3.90	0.00	0.00	2.03	0.06	8.52
6.2	6.67	6.67	6.67	6.67	6.67	7.13	0.00		0.00	6.67	6.67	6.67	6.70	0.00	6.67
7.1	6.18	0.00	0.00	0.00	0.00	0.00	2.31		0.00	10.00	0.00	0.00	0.00	0.00	0.00
7.2	8.33	6.94	6.67	6.39	0.00	9.44	4.72		0.00	10.00	7.22	4.44	7.78	0.00	7.78
7.3	9.43	9.70	9.41	9.61	9.50	9.91	8.92		8.30	9.82	9.02	8.95	9.47	9.01	9.52

Source: Own source

Figure 4.3.: Map of Good Performance

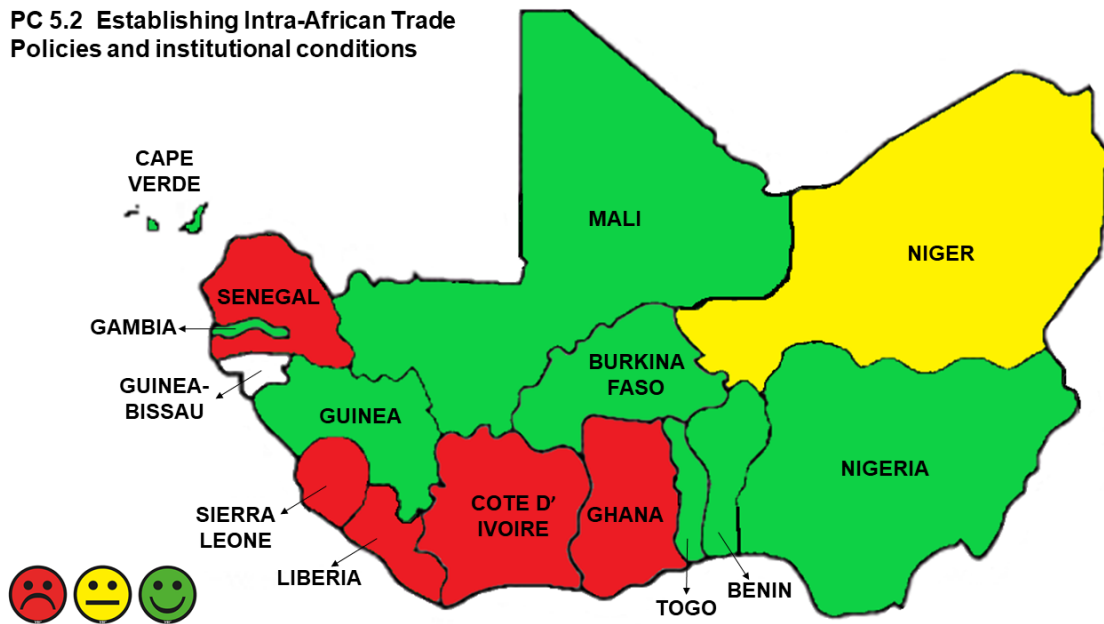
PC 5.1 Tripling Intra-African Trade for agriculture commodities and services



Source: Own source

Figure 4.4.: Map of Bad Performance

PC 5.2 Establishing Intra-African Trade Policies and institutional conditions



Source: Own source

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5. Chapter

Voting vs. Non-Voting in Senegal: A Nested Multinomial Logit Model Approach

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Paper prepared to be submitted at the "European Journal of Political Economy"

Abstract

In democratic systems, elections are considered a mechanism to ensure that efficient policies seeking the wellbeing of the population are implemented by the government, although the reality often reflects the opposite. Governments usually act inefficiently due to problems of government performance such as capture and low accountability. In the African continent, the republic of Senegal is considered an example of a stable democracy. Electoral processes in the country have been considered relatively fair. However, the decline in the voter turnout over the past elections suggests that the party system is failing to engage voters. This study assesses influencing factors both in voting behavior in Senegal and in the decision to abstain. We estimated nested multinomial logit models including the alternative Abstention to determine the importance of the non-voters group in the policy making process. We found that even though people in general make their decision more non-policy oriented, abstainers, compared to those who cast a vote, tend to choose more retrospectively oriented and less policy and non-policy oriented. Furthermore, our findings show that this group of non-voters hold the government more accountable and have a higher political weight for the incumbent party. Thus, they could incentive the government to choose and implement more efficient policies. As regards the non-policy component, we observed that abstainers usually do not feel close to any party. Furthermore, a large share of people stating their intention to vote, do not have Party Identification (*PI*) and, in general, people tend to lie about their intended vote choice. Therefore, we might assume that most people with no *PI* who said that would vote for BBY, actually decided to abstain or vote for an opposition party. Thus, should the main opposition parties form a coalition, their probability of winning the elections is higher, as long as, abstainers decided to vote. Finally, after estimating the First Order Condition (FOC) and Second Order Condition (SOC), and finding a Local Nash Equilibrium (LNE), we noted that the main opposition parties are perceived to be closer to the optimal policy positions than the ruling party, which gives an incentive to the incumbent to change its policy positions as policy-oriented voters might choose an opposition party instead.

5.1. Introduction

Elections are considered a vital principle of democracy. An electoral process is commonly thought to be a mechanism to ensure that efficient policies seeking to reduce poverty

and achieve prosperity are implemented by the government. However, in reality electoral competition does not necessarily guarantee the implementation of policies in favor of the whole society. In fact, governments usually apply inefficient policies due to problems of government performance such as capture and low accountability. Additionally, even though the political participation is a constitutional right, some people also consider the act of voting as a citizen's civic responsibility. However, it is clear that not all people take part in electoral processes. The purpose of this research study is to evaluate the importance of this group of people in the policy making process in Senegal. More specifically, we are looking to determine whether abstainers could motivate the Senegalese government to design and implement efficient policies.

Over the past decades serious scholarly attention has been given to the study of voter behavior, for example Downs (1957), Campbell et al. (1960), Lazarsfeld et al. (1968) and Lipset and Rokkan (1967) are among the main authors addressing this issue. Other important amount of research have been devoted to the analysis of government performance, for instance Bailey (1999) and Stevens (2005). Furthermore, there is also a few amount of research studies combining both topics such as, Bardhan and Mookherjee (2002), Keefer and Khemani (2005), Henning et al. (2014) and Seide (2014). However, in the body of theoretical and empirical literature little attention has been given to the role of non-voting on voter behavior analysis. In this regard, Thurner and Eymann (2000) drew the attention on this neglected topic and contributed with their study combining the spatial models of candidate/party choice and abstention/participation choice.

Other studies such as Owen and Grofman (1984) for instance, have referred to the paradox of non-voting. According to them, in a supposed scenario where all voters assign positive costs to voting, if all decide to vote, each will find their vote useless as it is highly unlikely to affect the outcome. On the other hand, if no one votes, then the vote becomes extremely valuable and thus, the paradox occurs. Another voting paradox was identified by Kooreman and Haan (2003). They argued that in a binary election where potential voters can abstain and there is a cost of voting, the proposal with the lowest support may still be the most likely to win the election as members of the majority have an incentive to free ride on each other, giving the minority an advantage.

The implications of non-voting for democracy have been studied by authors like Bennett and Resnick (1990) who found that non-voting has an impact on some domestic policies in the United States, especially spending on welfare state programs. As pointed

by Kirchgässner (1992), voting is an individual decision that is irrelevant for the individual himself/herself and for all other individuals, but the collective decision is relevant for all individuals. Therefore, they are of high relevance for the society. Furthermore, as Feddersen and Pesendorfer (1999) mentioned, the level of information of the electorate is also determinant regarding the level of participation. In their research they showed that more informed voters are more likely to vote than their less informed counterparts.

According to Bannon (2003) another important factor to highlight is that having a political preference does not necessarily indicate someone's vote choice. He stated that in an election campaign, only small percentages of the electorate identify themselves as "non-voters" or voice their intention not to vote. However, even if all identified as "don't know" do not vote, this still does not represent the actual percentage of the electorate who actually abstain, because even voters with a political preference refrain from voting.

People decide to abstain for different motives. Authors such as Thurner and Eymann (2000), as well as, Plane and Gershtenson (2004) have studied, by means of spatial models of voting, indifference and alienation towards the candidate or party as reasons affecting the individual probability of voting.

As mentioned previously, we are looking to assess the importance of Senegalese abstainers in the policy making process. In this context, as pointed by Resnick (2013) voter turnout is an important aspect of the quality of the democracy for a country, and a massive participation means more responsiveness from the government towards a large share of the population. However, his examination of the first round of the 2012 presidential election revealed a low level of turnout and a high degree of electoral volatility.

This study proceeds as follows: First, we present the nested multinomial logit model that was developed, as well as, the econometric tools applied in the analysis. Second, we give an overview of the data and a description of the variables used. The following section shows the empirical estimations and results for the abstention/participation decision in the Senegalese multi-party system. In the last part of the paper we present our conclusion and summary of the research.

5.2. Methodology

5.2.1. Voter Behavior

It is well known that not all voters decide to participate in electoral processes. Thus, to analyze such decision, the alternative Abstention must be included in the choice set. In this sense, voter behavior can be modeled based on the rational choice approach, where the voter's decision depends on the alternative differential $V_{iA} - V_{iB}$. Furthermore, to include all unknown factors involved in the decision process, a probabilistic voter model is estimated. This allows the inclusion of an individual-specific stochastic component (μ_{ik}) in the utility function (U_{ik}) comprising these unknown factors.

$$P_{iA}(A, B) = Prob(U_{iA} \geq U_{iB}) \text{ where } U_{ik} = V_{ik} + \mu_{ik}, k = A, B \quad (5.1)$$

Discrete choice models are particularly appropriated to estimate probabilistic voter models, as they explain choices between two or more alternatives. More specifically, these models answer to the questions: Who?, what? and how?. Furthermore, the choice set fulfills three requirements: It must be *collectively exhaustive*, *mutually exclusive* and have a *finite number of alternatives*.

A Random Utility Maximization (RUM) model is usually applied to derive Discrete choice models. Here, the voter i chooses, from the choice set, the alternative k that provides him the highest utility U_{ik} . In other words, the greater the utility of an alternative, the more likely is that the voter will choose it.

The random unknown part μ_{ik} of the utility function U_{ik} is assumed to be independently, identically extreme value distributed (iid), and then a logit model was derived. Since the choice set includes several alternatives, the model was extended to a multi-alternative estimation, where voters can choose an alternative k from a set of alternatives K . The logit model was derived based on McFadden (1974, 1982) as:

$$P_{ik}(K) = \frac{e^{V_{ik}}}{\sum_{k=1}^K e^{V_{ik}}} \quad (5.2)$$

Like Thurner and Eymann (2000) we are proposing a model that simultaneously combines the choice among several parties and the alternative Abstention. To this end, a nested multinomial logit model based on Croissant (2012) and Greene (2008) was devel-

oped:

$$P_{ik}(K) = P_{ik|m}P_m \quad (5.3)$$

with

$$P_{ik|m} = \frac{e^{V_{ik}}}{\sum_k e^{V_{ik}}} \text{ where } V_{ik} = \alpha_k + \beta x_{ik} + \delta_k r_i \quad (5.4)$$

and

$$P_m = \frac{\left(\sum_k e^{V_{ik}} \right)^{\lambda_m}}{\sum_m \left(\sum_j e^{V_{ij}} \right)^{\lambda_m}} \quad (5.5)$$

where α_k is an alternative specific constant, x_{ik} is an alternative specific variable with a generic coefficient β , and r_i is an individual specific variable with an alternative specific coefficient δ_k . The alternative specific coefficients are estimated with one of them set to zero and the remaining coefficients are interpreted with respect to the alternative whose coefficient was set to zero. On the contrary, generic coefficients are constant for all alternatives.

The conditional probability (equation 5.4) is the exponential expected utility of voter i from alternative k divided by the sum of the exponential expected utilities of all the alternatives within a nest m . In other words, it is the probability that voter i chooses alternative k that belongs to a nest m . The marginal probability (equation 5.5) is the sum of the exponential expected utilities of all the alternatives within a nest to the power of λ_m (elasticity of nest m), divided by the sum of the exponential expected utilities for all nests. Finally, the probability that voter i chooses alternative k (equation 5.3) is calculated by multiplying the conditional probability of choosing alternative k if the nest m is chosen times the marginal probability of choosing the nest m . For this model to be compatible with the RUM, all the nest elasticities have to be in the interval from 0 to 1.

The nested multinomial logit model estimated in this paper includes three components or voting motives: non-policy oriented (V_{ik}^{NP}), policy oriented (V_{ik}^P) and retrospective oriented (V_{ik}^R). The voter's utility function is now as follows:

$$V_{ik} = V_{ik}^{NP} + V_{ik}^P + V_{ik}^R \quad (5.6)$$

Not all voters are well informed and aware of policies, especially in developing countries. Therefore, voters might apply non-policy indicators to estimate their expected utility, such as their socio-demographic characteristics x_{ij} , as well as, their approval of the incumbent's work y_{ig} . Another variable included in the utility function is party identification PI_{ik} that works as an intensifier in the preferences of voters towards a candidate.

$$V_{ik}^{NP} = \sum_j^J \alpha_{kj} x_{ij} + \alpha_k y_{ig} + \alpha PI_{ik} \quad (5.7)$$

The policy oriented voter's utility function is calculated based on the spatial voting model (Davis et al., 1970; Enelow and Hinich, 1984), as the squared distance between a voter's position x_{id} on a specific issue d and the perceived position taken by the party or candidate y_{ikd} on the same issue:

$$V_{ik}^P = -\sum_d^D \beta_d (y_{ikd} - x_{id})^2 \text{ where } (y_{ikd} - x_{id}) = D_{ikd} \quad (5.8)$$

The coefficient β is always negative, because the greater the distance between the voter's position and the party/candidate's position, the less is the utility. We considered the minimal negative distance for the alternative Abstention. Then, the greater the distance, the greater is the benefit from abstaining, which agrees with the voting paradox.

As regards the retrospective voting motive (Fiorina, 1981), voters can express a general assessment of the past performance of a party/candidate or the government. They use observable welfare indicators Z_{ir} determined by governmental policies (γ_G).

$$V_{ik}^R = \sum_r^R \delta_{kr} Z_{ir} (\gamma_G) \quad (5.9)$$

5.2.2. Government Performance

The estimation of marginal effects (ME) is necessary to assess government performance, because they show how sensitive are the voters to changes in policy, non-policy and retrospective voting motives.

- For the variables with generic coefficients ME were estimated as follows:

$$\frac{\partial P_{ig}}{\partial D_{igd}} = \left| P_{ig} (1 - P_{ig}) \beta_d \left[\frac{(1 - P_{ig|m})}{(1 - P_{ig})} + \lambda_m \frac{(P_{ig|m} - P_{ig})}{(1 - P_{ig})} \right] \right| \quad (5.10)$$

- For the variables with alternative specific coefficients ME were estimated as follows::

$$\frac{\partial P_{ig}}{\partial Z_{ir}} = \left| P_{ig} \left(\delta_g - \sum_k^K \delta_k P_{ik} \right) \left[\frac{(P_m \delta_g - \sum_k^K \delta_k P_{ik})}{P_m (\delta_g - \sum_k^K \delta_k P_{ik})} + \lambda_m \frac{[1 - P_m] \sum_k^K (\delta_k P_{ik})}{P_m (\delta_g - \sum_k^K \delta_k P_{ik})} \right] \right| \quad (5.11)$$

where g refers to the government party.

These marginal effects point out the extent to which the probability P_{ig} changes when there is a one-unit change in the independent variables.

To evaluate the relative importance of the different motives, the relative marginal effects (RME) are calculated for each voter:

$$RME_i^{NP} = \frac{ME_i^{NP}}{ME_i^{NP} + ME_i^P + ME_i^R} \quad (5.12)$$

$$RME_i^P = \frac{ME_i^P}{ME_i^{NP} + ME_i^P + ME_i^R} \quad (5.13)$$

$$RME_i^R = \frac{ME_i^R}{ME_i^{NP} + ME_i^P + ME_i^R} \quad (5.14)$$

Government Accountability

Based on the RME , a government accountability index (GA) is estimated to verify whether electoral competition encourages governments to develop and implement efficient policies. The assumption is that, when voters choose more non-policy oriented, government accountability is low and vice versa.

$$RME^{NP} = \sum_{i=1}^n RME_i^{NP} \quad (5.15)$$

$$RME^P = \sum_{i=1}^n RME_i^P \quad (5.16)$$

$$RME^R = \sum_{i=1}^n RME_i^R \quad (5.17)$$

$$GA = \frac{RME^P + RME^R}{RME^{NP} + RME^P + RME^R} \quad (5.18)$$

where policy and retrospective *RME* can be added up in order to compare policy vs. non-policy motives.

Government Capture

Finally, another assumption is that the more policy oriented a voter chooses, the more importance he has for parties. Therefore, the next step is to calculate the individual relative political weights of voters, to then estimate the government capture index (*GC*).

$$g_i = \frac{ME_i^P}{\sum_{i=1}^n ME_i^P} \quad (5.19)$$

We analyze different groups from the electorate to identify those with a greater political weight.

$$GC_{1vs2} = \frac{\frac{\sum_{i \in 1} g_i}{a_1}}{\frac{\sum_{i \in 2} g_i}{a_2}} \quad (5.20)$$

where a_1 and a_2 are the share of voters in group 1 and 2 respectively.

5.2.3. Nash Equilibrium

We intended to identify the equilibrium policy positions where the party in power has no incentive to move away from. Since we were estimating a logit model where the error terms were assumed to be Type I extreme value distributed, a Local Nash Equilibrium (LNE) could be found (Schofield, 2007). In this sense, based on the approach of Petri and Henning (forthcoming), to find the point where the probability P_{ig} is maximized, the following FOC was derived:

$$\frac{\partial P_{ig}}{\partial y_{igd}} = \frac{\partial P_{ig}}{\partial D_{igd}} \frac{\partial D_{igd}}{\partial y_{igd}} \quad (5.21)$$

$$\frac{\partial P_{ig}}{\partial y_{igd}} = P_{ig}(1 - P_{ig})\beta_d \left[\frac{(1 - P_{ig|m})}{(1 - P_{ig})} + \lambda_m \frac{(P_{ig|m} - P_{ig})}{(1 - P_{ig})} \right] 2(y_{igd} - x_{id}) \quad (5.22)$$

where the absolute political weight g_{igd} of voter i for the governmental party g for the issue d is:

$$g_{igd} = P_{ig}(1 - P_{ig})\beta_d \left[\frac{(1 - P_{ig|m})}{(1 - P_{ig})} + \lambda_m \frac{(P_{ig|m} - P_{ig})}{(1 - P_{ig})} \right] \quad (5.23)$$

FOC for all voters:

$$\sum_{i=1}^n \frac{\partial P_{ig}}{\partial y_{igd}} = 0 \quad (5.24)$$

$$\sum_{i=1}^n g_{igd} 2(y_{igd} - x_{id}) = 0 \quad (5.25)$$

$$\sum_{i=1}^n g_{igd}(y_{gd}^* - x_{id}) = 0 \quad (5.26)$$

$$\sum_{i=1}^n g_{igd} y_{gd}^* = \sum_{i=1}^n g_{igd} x_{id} \quad (5.27)$$

$$y_{gd}^* = \sum_{i=1}^n \left[x_{id} \left[\frac{g_{igd}}{\sum g_{igd}} \right] \right] \quad (5.28)$$

where y_{gd}^* is the optimal political position for the governmental party g for the issue d and $\frac{g_{igd}}{\sum g_{igd}}$ is the relative political weight of voter i for the governmental party g for the issue d .

The FOC $\frac{\partial P_{ig}}{\partial y_{igd}} = 0$ was satisfied, where the probability that the governmental party wins the election is maximized.

After finding a Nash-Equilibrium, we confirmed whether the SOC was fulfilled, i.e. the Hessian matrix was negative semi-definite. In our study, this was true, which means that a LNE was estimated. The SOC was derived as follows:

if $d \neq p$, then

$$\frac{\partial P_{ig}^2}{\partial^2 y_{igd} y_{igp}} = \sum [4\beta_d \beta_p (y_{igd} - x_{id})(y_{igp} - x_{ip}) P_{ig} \quad (5.29)$$

$$[(\lambda_m - 1)(P_{ig|m})(1 - P_{ig|m}) + (\lambda_m(P_{ig|m} - 2P_{ig}) + (1 - P_{ig|m}))$$

$$((1 - P_{ig|m}) + \lambda_m(P_{ig|m} - P_{ig}))]]$$

if $d = p$, then

$$\frac{\partial P_{ig}^2}{\partial^2 y_{igd} y_{igd}} = \sum [4(y_{igd} - x_{id})^2 \beta_d^2 P_{ig} [(\lambda_m - 1)P_{ig|m}$$

$$(1 - P_{ig|m}) + (\lambda_m(P_{ig|m} - 2P_{ig}) + (1 - P_{ig|m}))$$

$$((1 - P_{ig|m}) + \lambda_m(P_{ig|m} - P_{ig}))] + P_{ig} \beta_d^2 \quad (5.30)$$

$$((1 - P_{ig|m}) + \lambda_m(P_{ig|m} - P_{ig}))]$$

5.3. Data

We designed a voter survey including questions on socio-demographic characteristics, voting behavior, policy positions and network characteristics. It was carried out in Senegal on January 2019 by the Senegalese Agricultural Research Institute. The interviews were conducted face-to-face in the respective dialect or language of the interviewees. The sample contains 1000 individuals from five different regions across the country. After data cleaning, 844 complete observations remained for the analysis of voters' behavior.

5.3.1. Dependent Variable

In a probabilistic voter model the dependent variable is usually the actual or intended vote choice. Nevertheless, given the approach of the nested multinomial logit model for this paper, the alternative Abstention was added. In the questionnaire, respondents were asked:

If a presidential election were held tomorrow, which party's candidate would you vote for?

The respondents showing an intended vote choice for the ruling party were considered to be part of the “Government” nest. On the other hand, the interviewees who did not show support for the incumbent party were considered members of the “Non-Government” nest. Within the latter are the voters showing support for any of the opposition parties, as well as, those who decided not to participate in the electoral process. As pointed by Thurner and Eymann (2000), the number of people who revealed their intention of abstaining in an election is usually underestimated in surveys due to effects of social (un)desirability. Therefore, following the aforementioned approach we have considered the interviewees who answered “Don’t know” and “Will not vote” as part of the Abstention alternative.

Table 5.1 shows the results of the survey, as well as, the official presidential election outcome. Even though the survey results are not very close to the actual election outcome, the party in power BBY is a clear winner in both scenarios. For the analysis in the empirical section we consider all parties and Abstention. Then, the whole set of alternatives is: $K = \{BBY, Rewmi, Pastef, PUR, Niang \text{ and } Abstention\}$.

Table 5.1.: Senegalese presidential election results

	BBY	Rewmi	Pastef	PUR	Niang	Abstention
Presidential election 2019	38.48%	13.55%	10.35%	2.69%	0.98%	33.95%
Own survey 2019	70.46%	3.72%	5.30%	1.13%	0.34%	19.05%

Source: (Constitutional Council of Senegal, 2019), own survey

5.3.2. Independent Variables

The variables with more than 10% of missing values were excluded from the analysis and the remaining were imputed with the mean value, except for the policy positions that were imputed via linear regressions. The independent variables were divided into policy, retrospective and non-policy variables.

Policy Variables: Nine different policy issues were considered. The policy positions on these issues were asked based on a five-point scale. The interviewees were asked about their own policy position, as well as, their perceived positions of the parties on the following issues:

1. 1-Agree with liberal policies, 5-Disagree with liberal policies (Social)
2. 1-Left (socialism), 5-Right (capitalism) (Ideology)
3. 1-Tax revenues should be used to provide public services, 5-Tax revenues should be used to further improve economic growth (PSvsEG)
4. 1-Public services expenditures should be mainly invested in improving education and health services, 5-Public services expenditures should be rather used to reduce insecurity and violence (EHvsIV)
5. 1-Economic growth shall be achieved through the development of the agricultural sector, 5-Economic growth shall be achieved through the development of the industrial sector (AGRvsIND)
6. 1-Increase productivity of food crops to guarantee food security, 5-Increase productivity of cash crops to guarantee greater farm income (FoodvsCash)
7. 1-Benefit the agricultural sector through technological progress, 5-Benefit the agricultural sector through better access to markets (TPvsAM)
8. 1-Agricultural sector should be taxed, 5-Agricultural sector should be protected (TaxvsProtect)
9. 1-Decision-making process without population, 5-Decision-making process with population (Accountability)

These were used to calculate distances for parties as the difference between the voters' own policy position and the perceived policy position of the parties. For the alternative Abstention, the minimal negative distance was considered. Therefore, the utility of non-voting is greater than the utility of voting and hence the voting paradox is fulfilled.

Retrospective Variables: In the survey, questions of satisfaction with government performance were asked. More specifically, there were questions where the interviewees evaluated the economic situation of the country and their own personal living conditions. Additionally, there were questions addressing the level of satisfaction of the interviewees with the performance of the current president, as well as, the implementation of agricultural policies by the government.

Non-policy Variables: A whole set of sociodemographic variables was included, as well as, other variables measuring the level of trust of voters on different types of institutions. Furthermore, to measure party loyalty, the variable Party ID was created. More specifically, alternative specific dummies were created, where “1” indicates party affiliation for that specific party and “0” otherwise. In the case of the alternative Abstention, the variable was set to “0” since there is no such thing as party identification for abstention.

Based on Mattes (2008), a Lived Poverty Index (LPI) was estimated. The level of poverty is high if it is closer to 5 and low if it is closer to 1. Likewise, an Ownership Index (OI) was calculated, where the number of possessions increases when the index approximates 6 and it decreases the closer it is to 0. Additionally, we created the dummy variable “informed” based on a Political Knowledge Index (PKI). The PKI was designed as the result of the sum of all correct answers of the voter to a number of exogenous questions about political knowledge. Then, we set its median as the frontier that defines if the voter is informed or uninformed.

5.4. Empirical Application and Results

5.4.1. Nested Multinomial Logit Model

We estimated probabilistic voter models, more specifically, nested multinomial logit models (NML) to observe the factors that influence voting behavior in Senegal, as well as, those factors that influence people’s decision of abstaining. With the data previously described, we performed different model specifications including only the independent variables that, according to a p-value test, were significant. The goodness of fit was defined by means of the Akaike Information Criterion (AIC) and the Log-likelihood function. Additionally, the ruling party was taken as the reference for interpretation purposes. Finally, we tested for multicollinearity among these variables through the estimation of condition indices and variance decomposition proportions. In our optimal NML models we did not observe multicollinearity.

5. Voting vs. Non-Voting in Senegal: A Nested Multinomial Logit Model Approach

Table 5.2.: Nested Multinomial Logit Models

AIC =	Model 1				Model 2			
	960.2				962.76			
VARIABLES	Coefficients	Standard Error	z-value	Pr(> z)	Coefficients	Standard Error	z-value	Pr(> z)
Abstention:(intercept)	1.9693	1.1592	1.7000	0.0890 .	0.6416	0.8787	0.7300	0.4653
Niang:(intercept)	-25.5810	39.4397	-0.6500	0.5170	-3.5743	52.8391	-0.0700	0.9461
Pastef:(intercept)	-0.1235	1.7964	-0.0700	0.9450	5.3259	1.7178	3.1000	0.0019 **
PUR:(intercept)	-1.0056	5.8305	-0.1700	0.8630	-1.3454	5.1023	-0.2600	0.7920
Rewmi:(intercept)	-0.8436	2.2581	-0.3700	0.7090	4.1262	2.0564	2.0100	0.0448 *
PSvsEG	-0.1296	0.0515	-2.5200	0.0120 *	-0.1396	0.0474	-2.9500	0.0032 **
FoodvsCash	-0.1085	0.0593	-1.8300	0.0670 .	-0.0995	0.0592	-1.6800	0.0930 .
Party_id	6.1441	1.0621	5.7800	0.0000 ***	6.2231	0.9168	6.7900	0.0000 ***
Abstention:Trust_media	0.2695	0.1553	1.7400	0.0830 .	0.2515	0.1416	1.7800	0.0756 .
Niang:Trust_media	2.9692	8.9953	0.3300	0.7410	1.7342	11.8977	0.1500	0.8841
Pastef:Trust_media	-0.0222	0.4165	-0.0500	0.9570	-0.0137	0.3746	-0.0400	0.9709
PUR:Trust_media	0.2613	1.5814	0.1700	0.8690	0.2530	1.5580	0.1600	0.8710
Rewmi:Trust_media	-0.5033	0.4060	-1.2400	0.2150	-0.7315	0.3700	-1.9800	0.0480 *
Abstention:Trust_president	-0.6097	0.3134	-1.9500	0.0520 .	-0.5491	0.2777	-1.9800	0.0480 *
Niang:Trust_president	-0.8694	5.3895	-0.1600	0.8720	-0.7668	4.9735	-0.1500	0.8775
Pastef:Trust_president	-0.8224	0.5416	-1.5200	0.1290	-0.8497	0.4699	-1.8100	0.0706 .
PUR:Trust_president	-0.5753	2.6174	-0.2200	0.8260	-0.5421	1.2206	-0.4400	0.6570
Rewmi:Trust_president	-0.8752	0.4952	-1.7700	0.0770 .	-0.8247	0.4409	-1.8700	0.0614 .
Abstention:Satisfaction_president	-0.6083	0.3182	-1.9100	0.0560 .	-0.5433	0.2680	-2.0300	0.0426 *
Niang:Satisfaction_president	-0.6632	4.6399	-0.1400	0.8860	-0.8373	4.9864	-0.1700	0.8667
Pastef:Satisfaction_president	-1.2154	0.7070	-1.7200	0.0860 .	-1.2173	0.5155	-2.3600	0.0182 *
PUR:Satisfaction_president	-0.7240	2.4990	-0.2900	0.7720	-0.6380	1.5356	-0.4200	0.6778
Rewmi:Satisfaction_president	-0.9405	0.5111	-1.8400	0.0660 .	-0.9102	0.3695	-2.4600	0.0138 *
Abstention:OI	-0.3591	0.6035	-0.6000	0.5520				
Niang:OI	14.5604	36.6231	0.4000	0.6910				
Pastef:OI	4.8101	2.1661	2.2200	0.0260 *				
PUR:OI	0.3775	3.8722	0.1000	0.9220				
Rewmi:OI	3.3750	2.1350	1.5800	0.1140				
Abstention:PKI	-0.0652	0.0655	-1.0000	0.3190				
Niang:PKI	0.8931	5.3232	0.1700	0.8670				
Pastef:PKI	0.0087	0.2216	0.0400	0.9690				
PUR:PKI	0.0075	0.3368	0.0200	0.9820				
Rewmi:PKI	0.4091	0.2236	1.8300	0.0670 .				
Abstention:LPI					0.2519	0.1578	1.6000	0.1103
Niang:LPI					-1.0678	5.7567	-0.1900	0.8528
Pastef:LPI					-1.2080	0.3415	-3.5400	0.0004 ***
PUR:LPI					0.1089	0.7939	0.1400	0.8909
Rewmi:LPI					-0.4436	0.4429	-1.0000	0.3165
iv:government	0.2952	0.0662	4.4600	0.0000 ***	0.2951	0.0610	4.8400	0.0000 ***
iv:non_government	0.8311	0.3413	2.4400	0.0150 *	0.8980	0.3401	2.6400	0.0083 **
Log-Likelihood:	***p<0.001, **p<0.01, *p<0.05, . p<0.10				***p<0.001, **p<0.01, *p<0.05, . p<0.10			
McFadden R ² :	-445				-451			
Likelihood ratio test :	0.405				0.397			
	$\chi^2 = 606$ (p.value $\leq 2e-16$)				$\chi^2 = 594$ (p.value $\leq 2e-16$)			

Source: Own estimation

The constants of our models absorb all the information not comprised on the rest of variables. The policy issues PSvsEG and FoodvsCash turned out to be significant for both models with negative coefficients. This means that the greater the distance, the lower is the utility that a voter receives from supporting one of the parties within the

choice set and consequently, lower is the probability to choose one of such alternatives. On the other hand, concerning the alternative Abstention, the greater the distance, the greater is the benefit from not participating in the electoral process. Furthermore, the last significant attribute in our models was Party Identification (PI) with positive coefficients. This implies that, when a voter has party affiliation for a specific party, he will be likely to support such party.

Our models suggest that the more the voters trust the media, the higher is the probability to abstain compared to the ruling party BBY. Furthermore, model 2 indicates that the more a voter trusts the media, the less is the probability that he chooses Rewmi and therefore, the higher is the probability to choose the government party. Likewise, the more the voters trust the president and the higher is their level of satisfaction with his performance, the less is the probability that voters will abstain or choose either Rewmi or Pastef, and higher the probability that they support the government party in the electoral process.

In the nested model 1, the results imply that voters with a better economic situation have a higher probability to decide in favor of Pastef compared to BBY. Also, those voters having a higher level of political knowledge, are likely to choose Rewmi rather than supporting the government party. The results of the nested model 2 in turn, suggest that the higher the LPI of voters, the less likely is that they will choose Pastef, and more likely is that they will support BBY in the elections.

The nests in the models were Government if the voter support the incumbent party and Non-Government if the voter decides to either abstain or choose an opposition party. Furthermore, the significant lambda values (λ) are the nest elasticities (iv:government and iv:non_government). The correlation values ($1 - \lambda$) within the iv:government nest were 0.7048 and 0.7049 for models 1 and 2 respectively, and for the iv:non_government nest were 0.1689 and 0.1020.

We then proceeded to calculate the utilities and probabilities. The results are displayed in table 5.3 and show the mean probabilities for each alternative. It is clear that the ruling party BBY has a substantial advantage compared to the other alternatives in both models.

Table 5.3.: Mean probabilities

Alternatives	Nested Model 1	Nested Model 2
Abstention	18.14%	18.14%
BBY	71.80%	71.80%
Niang	0.36%	0.35%
Pastef	4.99%	4.97%
PUR	1.05%	1.06%
Rewmi	3.66%	3.68%

Source: Own estimation

5.4.2. Government Performance Indicators

In order to evaluate the importance of each voting component, the next step was to obtain the relative marginal effects *RME*. The estimation of the *RME*, allows to see how sensitive are voters to changes in each voting motive. Unsurprisingly, as displayed in table 5.4, all voters choose, in general, more non-policy oriented. However, it is worth noting that non-voters tend to choose more retrospectively oriented and less policy and non-policy oriented than those who decided to take part in the electoral process.

Table 5.4.: Relative Marginal Effects

Components	Nested Model 1			Nested Model 2		
	Non-Voting	Voting	p-value	Non-Voting	Voting	p-value
Non-Policy	77.71%	80.03%	0.0000	75.92%	78.19%	0.0000
Policy	1.39%	1.55%	0.0002	1.55%	1.72%	0.0000
Retrospective	20.91%	18.42%	0.0000	22.52%	20.09%	0.0000

Source: Own estimation

In this context, the more policy and retrospectively oriented voters choose, the more accountable the government is. An accountable government in turn, develops and applies efficient policies whose beneficiaries are the majority of voters instead of lobbying groups with a customized agenda. We estimated accountability indices for both models and the results in table 5.5 indicate that, although in general, the electorate in Senegal does not hold the government accountable, non-voters have a higher accountability index.

Therefore, this group of people hold the government more accountable.

Table 5.5.: Accountability indices

	Nested Model 1	Nested Model 2
Non-Voting	22.29%	24.08%
Voting	19.97%	21.81%

Source: Own estimation

The government in its quest to be reelected might still have incentives to please the interests of special groups at the expense of the majority of voters. This problem of underrepresentation known as capture is common in electoral processes. To derive capture indices, we first had to calculate the political weight of groups within the electorate. The results in table 5.6 indicate, for example, that voters living in urban areas, women and young people capture the rural, men and old people respectively. Likewise, married people and farmers are captured by other marital status and non-farmers. Regarding ethnicities, voters belonging to the Maures ethnic group capture other ethnicities, whereas the Serere ethnicity is captured by other tribes. Additionally, people with a low LPI and those with less political knowledge capture the poorer, as well as, those with higher political knowledge respectively. Finally, it is important to highlight that non-voters have a higher political weight and capture people who cast a vote. Therefore, they could incentive the government to choose and implement more efficient policies.

Table 5.6.: Capture indices

	Nested Model 1	Nested Model 2
Rural vs. Urban	0.7646	0.7757
Men vs. Women	0.8451	0.8656
Young vs. Old	1.0573	1.0593
Married vs. Other	0.9016	0.8908
Serere vs. Other	0.8357	0.8109
Maures vs. Other	1.1762	1.2378
Farmer vs. Non-Farmer	0.9273	0.9317
Low LPI vs. High LPI	1.1578	1.0652
Low PKI vs. High PKI	1.2759	1.2053
Non-voting vs. Voting	1.5766	1.5817

Source: Own estimation

More in detail, as table 5.7 shows, the group of abstainers is comprised of more rural, younger and poorer voters than the group of people who cast a vote. Also, the non-voting group has more people belonging to the Maures ethnicity and with less political knowledge, compared to the group that takes part in the electoral process.

Table 5.7.: Socio-demographic Characteristics

	mean	mean	
	Non-Voting	Voting	p-value
Rural	0.8758	0.8220	0.0784
Age	36.5098	39.0753	0.0833
Kaffrine	0.1503	0.2171	0.0439
Serere	0.0261	0.0695	0.0077
Mandika_Bambara	0.0131	0.0347	0.0616
Maures	0.0392	0.0043	0.0302
LPI	2.8392	2.6751	0.0215
OI	0.4161	0.4525	0.0529
PKI	3.6405	4.1664	0.0021

Source: Own estimation

The analysis of the policy component is very important in our research study. Nevertheless, our results have already demonstrated that voters in Senegal choose more non-policy oriented. In this sense, the most relevant non-policy variable in our models was Party Identification. People who abstain usually do not have any party affiliation. On the other hand, people who take part in the electoral process and have PI mostly choose the party towards they have PI. However, when looking at table 5.8 we can see that more than 50% of the people who said that would vote, do not have PI. In this context, it is worth noting that, in general, people tend to lie when they are asked about their intended vote choice. Many of them use to say that they will support the incumbent party, but in reality they will abstain or choose an opposition party. Therefore, based on the results of our survey compared to the official election outcome (displayed in table 5.1), we might assume that most people without party affiliation did not choose BBY, but instead they decided to abstain or vote for an opposition party.

Table 5.8.: Analysis of the variable Party Identification

Party ID	Choice					
	Abstention	BBY	Rewmi	Pastef	Niang	PUR
No	128	335	9	15	1	4
Yes	25	271	22	27	2	5

Source: Own estimation

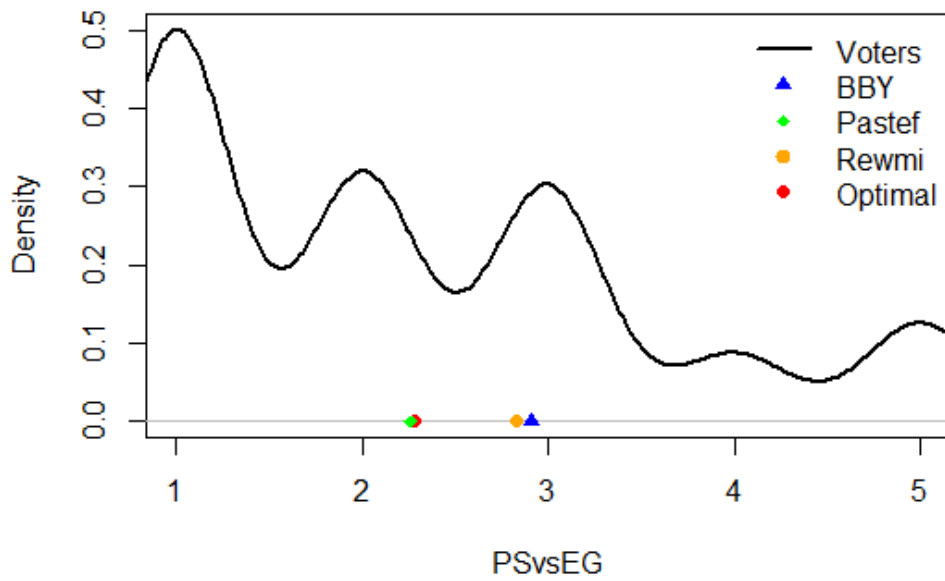
Additionally, according to the model people with higher OI and lower LPI, for simplicity named as rich people, choose Pastef. On the other hand, those with a higher PKI (informed people) are likely to choose Rewmi. In this sense, according to our data, almost 50% of the interviewees have no PI and are either rich or well informed. This suggests that if the two main opposition parties form a coalition they have a higher probability of winning the elections, as long as, abstainers decided to vote.

5.5. Nash Equilibrium

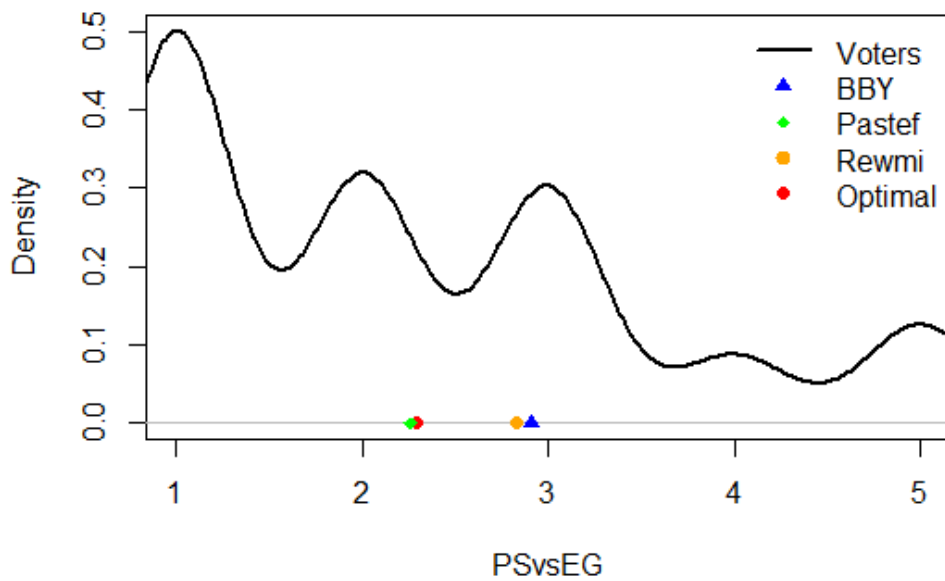
The last stage in our research study was to derive a FOC and a SOC to identify the optimal policy positions (Local Nash Equilibrium) for the issues PSvsEG and FoodvsCash. At these positions, the ruling party has no incentives to move away from because its probability of winning the elections is maximized. In the following figures 5.1 and 5.2 the optimal policy positions on each issue are displayed, along with the mean perceived policy

positions of the main parties and the positions of all voters.

Figure 5.1.: Policy Positions for PSvsEG



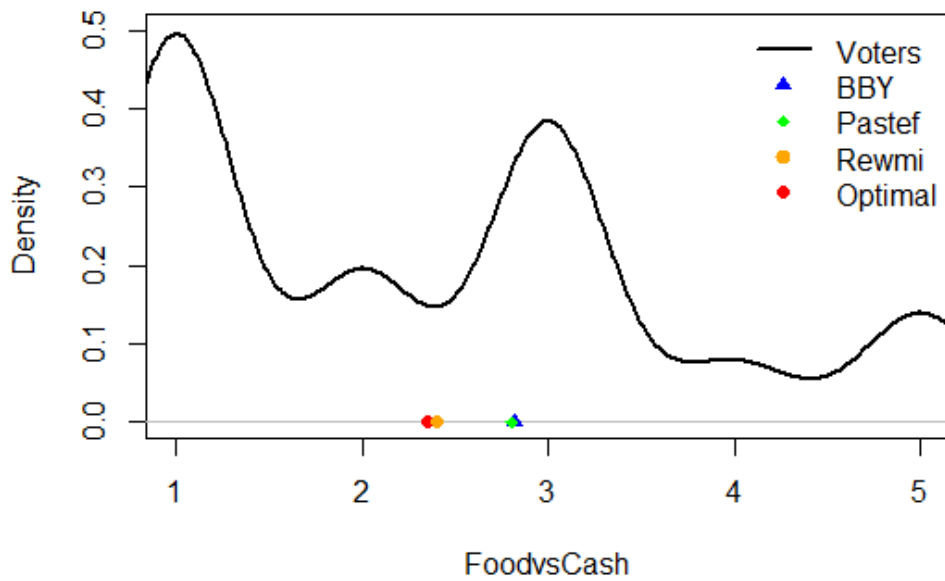
(a) Nested Model 1



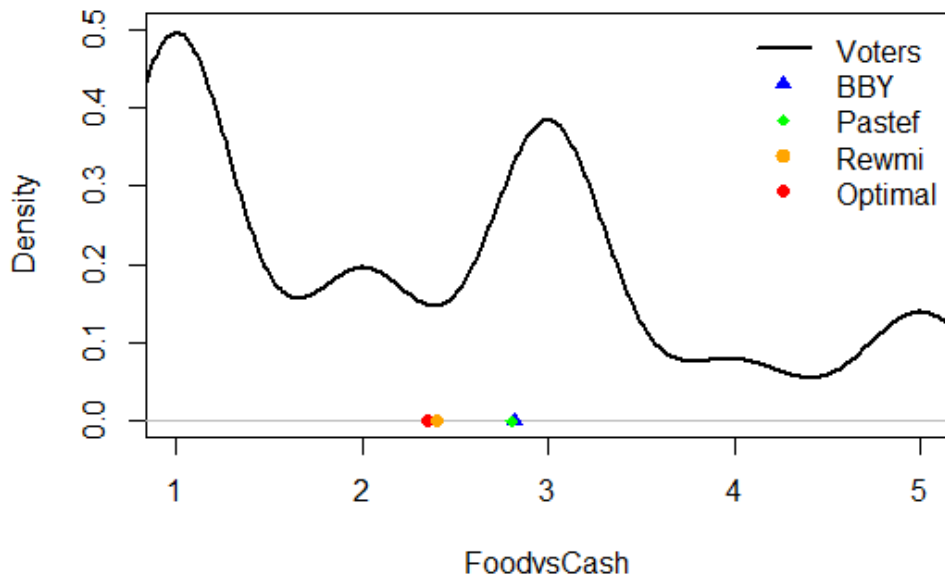
(b) Nested Model 2

Source: Own estimation

Figure 5.2.: Policy Positions for FoodvsCash



(a) Nested Model 1



(b) Nested Model 2

Source: Own estimation

For the incumbent party BBY to be on its optimal policy position for each issue, it

has to move to the left in both cases. In other words, regarding the issue PSvsEG, BBY should design and implement policies where tax revenues are mainly used to provide public services like health, education or security, rather than promoting economic growth. Likewise, concerning the issue FoodvsCash, the ruling party should promote more policies looking to guarantee food security, instead of securing a greater farm income. In this sense, the changes should be around 21% for the former issue and 16.5% for the latter. Should the party in power move to the aforementioned optimal positions, it would increase its probabilities of winning the elections by approximately one percentage point.

On the other hand, it is interesting to highlight the fact that the main opposition parties (Pastef and Rewmi) are perceived to be closer to the optimal policy position than BBY for both issues. Further in detail, for the issue PSvsEG, Pastef is perceived to have a policy position closer to the optimal, but Rewmi also has a closer position than BBY on the same issue. Regarding the issue FoodvsCash, Rewmi is the party perceived to be closer to the optimal position, and Pastef comes in second place, while the position of BBY is again the farthest.

5.6. Summary and Conclusions

The post-colonial history of Senegal has been considered a successful example of how to establish a stable democracy. Compared to its neighbor countries, that have experienced military takeovers or at least attempts at one and rigged electoral processes, the Senegalese elections have been considered relatively fair. However, there has been a decline in the voter turnout over the past elections, which means that the party system is somehow failing to engage voters in recent years.

In this study we evaluate the factors that influence voting behavior in Senegal, as well as, those factors that influence people's decision of abstaining. More specifically, we assess the importance of the non-voters group in the policy making process of the country, to determine if they could motivate the Senegalese government to implement efficient policies. For this purpose we estimated nested multinomial logit models including the alternative Abstention in the choice set.

Our results suggest that policy issues, party identification, variables related to the level of trust that voters have on the media and the incumbent, their level of satisfaction with the performance of the president, as well as, their Lived Poverty Index and political knowledge

are important when making an electoral decision. The estimations also point at the ruling party BBY as the winner and show that most people have a tendency to make their decision more non-policy oriented. Nonetheless, the group of abstainers tend to choose more retrospectively oriented and less policy and non-policy oriented compared to those who decided to participate in the elections. This implies that the group of non-voters have a higher accountability index and thus, hold the government more accountable.

As regards the capture indices, voters living in urban areas, women, non-married, non-farmers and young people, as well as, voters belonging to the Maures ethnic group and to other ethnicities different than Serere, and those with a low LPI and with less political knowledge, have a higher political weight for the incumbent party BBY. In this sense, abstainers are mainly comprised by young people, people with an ethnicity different than Serere, people from Maures and the less informed. This leads to the abstainers also having a higher political weight for the government party and therefore, capture people who cast a vote. This means, that from a perspective looking to the Senegalese society's welfare, they could incentive the government to choose and implement more efficient policies if they decided to participate in the elections.

The analysis of the policy component is very relevant in our research, but our results showed that Senegalese people choose more non-policy oriented. In this sense, we see that the most significant non-policy variable in our models was "Party Identification" and abstainers usually do not have party affiliation. Furthermore, more than 50% of the people who said that would vote, do not have PI and in general, people tend to lie when they are asked about their intended vote choice. Therefore, we might assume that most people without party affiliation did not choose BBY, but instead they decided to abstain or vote for an opposition party.

Additionally, our models suggest that rich people support Pastef. On the other hand, the informed voters are likely to choose Rewmi. According to our data, almost half of the interviewees have no PI and are either rich or well informed. This suggests that if the two main opposition parties form a coalition they have a higher probability of winning the elections, as long as, abstainers decided to vote.

The next stage in our study was to identify the optimal policy positions (Local Nash Equilibrium) for the policy issues, where the government maximizes its probability of winning and has no incentives to move away from. We observed that the main opposition parties are perceived to be closer to the optimal policy positions than the party in power

for both issues. This in turn implies that policy oriented voters might decide to choose an opposition party, giving an incentive to the ruling party to change its policy positions on these issues.

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6. Chapter

How Important Are Abstainers in Presidential Elections?: A Comparative Analysis between Africa and Latin America

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Paper prepared to be submitted at the "International Political Science Review"

Abstract

Even in countries with well functioning democracies, not all people with the right to vote in a presidential election decide to cast a vote. In order to study the importance of abstention in presidential elections in Africa and Latin America, data from Senegal and Honduras was analyzed. These countries have experienced a decline in the voter turnout over the past elections, which means that the party systems are somehow failing to engage voters in recent years. The purpose of this paper is to understand how people choose a certain party or candidate, as well as, how they decide to either vote or abstain. Moreover, we are looking to determine whether non-voters could motivate the governments to design and implement efficient policies. To achieve this, we estimated nested multinomial logit models including the alternative Abstention. Then, to evaluate government performance, we derived indicators for accountability and capture. Also, to determine the optimal policy positions for the governmental parties, First Order Condition (FOC) and Second Order Condition (SOC) were estimated for different issues. We concluded that, in these two developing countries, one of the factors that voters take into account when they decide to either vote or abstain, is their level of satisfaction with the performance of the president. Additionally, the incumbent is held more accountable when all non-government supporters are considered. Furthermore, since in both countries, the incumbents' voters are being captured by all other groups within the electorate, we could argue that abstainers, as well as, those who have chosen an opposition party/candidate can motivate the incumbent to choose the policies that better match the specific country needs in order to reduce poverty and undernutrition and promote economic growth. Finally, we found that the ruling parties BBY and PNH could increase their probabilities of being re-elected, if they choose policies that are more left oriented.

6.1. Introduction

To reduce poverty and undernutrition and increase economic growth in a country, the quality of governance is important as it can guarantee the implementation of efficient policies. To achieve this, electoral competition in democratic systems should promote a high performance of the incumbent by reflecting the interests of the whole society and serving to control the government. However, in reality, electoral competition often leads to policy failure due to low government accountability and government capture.

Even in countries with well functioning democracies, not all people with the right to vote in a presidential election decide to cast a vote. Some people consider voting as a civic duty of every citizen in a democratic country. On the other hand, others think that voting is often inconvenient, time-consuming and may even seem pointless, because the probability that the vote of one person will make a difference in the outcome is infinitesimally small. According to Solijonov (2016), even though the voter population has been growing globally and the number of countries that hold elections have increased, the global average voter turnout has decreased significantly over the past decades. Furthermore, Stockemer (2015) found that developed countries have a higher citizens' participations at elections than developing countries, which implies that development by itself leads to higher turnout. These statements correspond to the situation in Senegal. Despite the fact that Senegalese electoral processes have been considered relatively fair compared to its neighbor countries, there has been a decline in the voter turnout over the past elections. Similarly, in Honduras the level of abstention has increased during the past years. One of the reasons seems to be that many people do not trust the political parties and candidates. Also, the country has experienced a massive international migration. The purpose of this research study is to evaluate the importance of abstainers in the policy making process in Africa and Latin America. More specifically, we are looking to determine whether non-voters could motivate the governments to design and implement efficient policies. To this end, data from Senegal and Honduras was used for the analysis.

Serious scholarly attention has been given to the study of voter behavior, for example Downs (1957), Campbell et al. (1960), Lazarsfeld et al. (1968) and Lipset and Rokkan (1967) are among the main authors addressing this issue. Other important amount of research have been devoted to the analysis of government performance, for instance Bailey (1999) and Stevens (2005). There is also a few amount of research studies combining both topics such as, Henning et al. (2014) and Seide (2014), as well as, Keefer and Khemani (2005) and Bardhan and Mookherjee (2002), who argue that less electoral competition implies incentives for the government to implement policies that do not correspond to the needs and desires of the majority in the society. However, the incorporation of the aspects of abstention/participation in voter behavior study is not very common. Downs (1957) explained that citizens choose the party they believe will provide them a higher utility. However, if the party differential is equal to zero, they will abstain. Later, Riker and Ordeshook (1973) conceptualized the citizen's choice as a two-stage process, where the voter

first identifies a preferred candidate and then decides to vote or abstain. Further, Thurner and Eymann (2000) proposed a model where they consider the simultaneous choice among parties and the option abstention. The latter, as well as, Plane and Gershtenson (2004) have also studied, by means of spatial models of voting, indifference and alienation towards the candidate or party as reasons affecting the individual probability of voting.

This paper proceeds as follows: First, we shortly review some literature regarding the paradox of voting. Second, we present the developed nested multinomial logit model originally proposed by McFadden (1977) as a generalization of the multinomial logit model based on the idea that some alternatives may be joined in several groups or nests. Then, we give an overview of the datasets and a description of the variables used. The following section shows the empirical estimations and results for the abstention/participation models of the multi-party systems in Senegal and Honduras. In the next section, to determine the optimal policy positions for the governmental parties, FOC and SOC were estimated for different issues. Finally, we present a summary and our conclusions of the research.

6.2. Voting Paradox

Voting implies a benefit and a cost to the voter. A benefit is obtained when the voter changes the outcome of the election to what he desires. However, the probability that one vote would change the outcome of the election (the voter's pivot probability) is very low so the expected benefit is also small. On the other hand, the costs of the act of voting itself include time, money and resources. Additionally, voters have to become sufficiently informed to vote in line with their own interests and this is also costly. Looking at this, if voters act rationally, they should abstain. However, according to the voting paradox, electoral turnout is relatively high even though the costs will normally exceed the expected benefits. One explanation for this is the sense of civic duty.

Many researchers have been studying the paradox of voting. Riker and Ordeshook (1968) developed a calculus of voting in which it is rational for those who vote to do so and it is equally rational for those who do not vote not to do so. To this end, they included an additional component in the utility function that contains positive effects on the expected utility of voting. Then, they concluded that "the behavior of most people can be described by a theory of rational decision-making". According to, Owen and Grofman (1984) in a supposed scenario where all voters assign positive costs to voting, if all decide to vote, each will find their vote useless as it is highly unlikely to affect the outcome. On the other

hand, if no one votes, then the vote becomes extremely valuable and thus, the paradox occurs. The implications of non-voting for democracy have been studied by authors like Bennett and Resnick (1990) who found that non-voting has an impact on some domestic policies in the United States, especially spending on welfare state programs. Additionally, Kirchgässner (1992) deals with voting decisions, which he considers to be individual decisions that are irrelevant for the individual. However, the collective decision is relevant for all individuals. Further, he argues that following social (moral) rules, when they are deviated from the self-interest, implies a cost that is rather low in voting decision. Later, Grofman (1995) shows that the correlation between turnout and closeness of the elections can be positive or negative. This depends on the assumptions about the way voters form their expectations regarding whether or not their vote will be decisive. However, Myerson (1997) considered an example of a large voting game to illustrate the advantages of using a Poisson model of population uncertainty. He found that the expected turnout cannot be large if the act of voting is costly for all voters. On the contrary, Blais (2000) concluded that the rational choice model of voting does not appear to work. People who are aware that the probability of their vote being decisive is tiny should rationally abstain. However, most people vote in national elections, and most of them vote regularly.

Kooreman and Haan (2003) identified another voting paradox where, due to free riding of potential voters facing voting costs, the alternative with the highest number of supporters could lose a binary election. Bannon (2003), on the other hand, explains that political parties may target the less motivated voters with campaign techniques to encourage participation. This in turn could make campaigns more efficient and effective. Furthermore, Krajina and Prochazka (2017) studied the reasons and motives for voting and found that people decide to vote mainly to affect the outcome and to express a political view.

6.3. Methodology

6.3.1. Probabilistic Voter Model and Nested Multinomial Logit Model

It is well known that not all voters decide to participate in electoral processes. Thus, to analyze such decision, the alternative Abstention must be included in the choice set. In this sense, voter behavior can be modeled based on the rational choice approach, where the voter's decision depends on the alternative differential $V_{iA} - V_{iB}$. Furthermore, to include all unknown factors involved in the decision process, a probabilistic voter model is

estimated. This allows the inclusion of an individual-specific stochastic component (μ_{ik}) in the utility function (U_{ik}) comprising these unknown factors.

$$P_{iA}(A, B) = Prob(U_{iA} \geq U_{iB}) \text{ where } U_{ik} = V_{ik} + \mu_{ik}, k = A, B \quad (6.1)$$

Probabilistic voter models are estimated with Discrete Choice models, which are commonly used in political science research to analyze how voters decide between two or more alternatives in an election. More specifically, these models answer to the questions: Who?, what? and how?. Furthermore, the choice set fulfills three requirements: It must be *collectively exhaustive, mutually exclusive* and have a *finite number of alternatives*.

In order to derive the Discrete Choice model, a Random Utility Maximization (RUM) model is usually applied. Here, if the voter i acts rationally, he chooses the alternative k among K alternatives only if it provides him the highest utility U_{ik} . In other words, the greater the utility of an alternative, the more likely is that the voter will choose it.

The random unknown part μ_{ik} of the utility function U_{ik} is assumed to be independently, identically extreme value distributed (iid), and then a logit model was derived. Since Senegal and Honduras have multi-party systems and we also considered the alternative abstention, the model was extended to a multi-alternative estimation. The logit model was derived based on McFadden (1974, 1982) as:

$$P_{ik}(K) = \frac{e^{V_{ik}}}{\sum_{k=1}^K e^{V_{ik}}} \quad (6.2)$$

We were looking to assess the importance of abstainers in presidential elections in Senegal and Honduras. Therefore, following the approach of Thurner and Eymann (2000) we proposed a model that simultaneously combines the choice among several parties and the alternative abstention. To this end, we combined the probabilistic voter model of party/candidate choice with the participation/abstention choice in a single nested multinomial logit model based on Croissant (2012) and Greene (2008):

$$P_{ik}(K) = P_{ik|m}P_m \quad (6.3)$$

with

$$P_{ik|m} = \frac{e^{V_{ik}}}{\sum_k e^{V_{ik}}} \text{ where } V_{ik} = \alpha_k + \beta x_{ik} + \delta_k r_i \quad (6.4)$$

and

$$P_m = \frac{\left(\sum_k e^{V_{ik}} \right)^{\lambda_m}}{\sum_m \left(\sum_j e^{V_{ij}} \right)^{\lambda_m}} \quad (6.5)$$

where α_k is an alternative specific constant, x_{ik} is an alternative specific variable with a generic coefficient β , and r_i is an individual specific variable with an alternative specific coefficient δ_k . The alternative specific coefficients are estimated with one of them set to zero and the remaining coefficients are interpreted with respect to the alternative whose coefficient was set to zero. On the contrary, generic coefficients are constant for all alternatives.

The conditional probability (equation 6.4) is the exponential expected utility of voter i from alternative k divided by the sum of the exponential expected utilities of all the alternatives within a nest m . In other words, it is the probability that voter i chooses alternative k that belongs to a nest m . The marginal probability (equation 6.5) is the sum of the exponential expected utilities of all the alternatives within a nest to the power of λ_m (elasticity of nest m), divided by the sum of the exponential expected utilities for all nests. Finally, the probability that voter i chooses alternative k (equation 6.3) is calculated by multiplying the conditional probability of choosing alternative k if the nest m is chosen times the marginal probability of choosing the nest m . For this model to be compatible with the RUM, all the nest elasticities have to be in the interval from 0 to 1.

The nested multinomial logit model estimated in this paper includes three components or voting motives: non-policy oriented (V_{ik}^{NP}), policy oriented (V_{ik}^P) and retrospective oriented (V_{ik}^R). The voter's utility function is now as follows:

$$V_{ik} = V_{ik}^{NP} + V_{ik}^P + V_{ik}^R \quad (6.6)$$

Not all voters are well informed and aware of policies, especially in developing countries. Therefore, voters might apply non-policy indicators to estimate their expected utility, such as their socio-demographic characteristics x_{ij} , as well as, their level of trust on the incumbent y_{ig} . Another variable included in the utility function is party identification

PI_{ik} that works as an intensifier in the preferences of voters towards a candidate.

$$V_{ik}^{NP} = \sum_j^J \alpha_k x_{ij} + \alpha_k y_{ig} + \alpha PI_{ik} \quad (6.7)$$

On the other hand, if voters are well informed and interested in politics, they might decide based on the policy platforms proposed by the candidates. In this sense, the policy oriented voter's utility function is calculated based on the spatial voting model (Davis et al., 1970; Enelow and Hinich, 1984), as the squared distance between a voter's position x_{id} on a specific issue d and the perceived position taken by the party or candidate y_{ikd} on the same issue:

$$V_{ik}^P = -\sum_d^D \beta_d (y_{ikd} - x_{id})^2 \text{ where } (y_{ikd} - x_{id}) = D_{ikd} \quad (6.8)$$

The coefficient β is always negative, because the greater the distance between the voter's position and the party/candidate's position, the less is the utility. We considered the minimal negative distance for the alternative abstention. Then, the greater the distance to the closest party/candidate, the greater is the benefit from abstaining, which agrees with the voting paradox.

As regards the retrospective voting motive (Fiorina, 1981), voters can express a general assessment of the past performance of a party/candidate or the government. They use observable welfare indicators Z_{ir} determined by governmental policies (γ_G).

$$V_{ik}^R = \sum_r^R \delta_{kr} Z_{ir} (\gamma_G) \quad (6.9)$$

Note that in the estimation of our model, we assumed that the assessment of the economic performance of the government also has an impact on the voters' evaluation of the opposition parties, as well as, on the decision of refraining from voting.

6.3.2. Government Performance

Political parties choose their policy platforms in order to maximize their probability of winning the elections. Nevertheless, the implementation of efficient policies by the government can only take place if voters choose politically and retrospectively oriented. Therefore, in order to evaluate government performance, we derived the indicators for accountability and capture. In this sense, we estimated marginal effects (ME) for the three voting com-

ponents because they show how sensitive are the voters to changes in policy, non-policy and retrospective voting motives.

- For the variables with generic coefficients ME were estimated as follows:

$$\frac{\partial P_{ig}}{\partial D_{igd}} = \left| P_{ig} (1 - P_{ig}) \beta_d \left[\frac{(1 - P_{ig|m})}{(1 - P_{ig})} + \lambda_m \frac{(P_{ig|m} - P_{ig})}{(1 - P_{ig})} \right] \right| \quad (6.10)$$

- For the variables with alternative specific coefficients ME were estimated as follows::

$$\frac{\partial P_{ig}}{\partial Z_{ir}} = \left| P_{ig} \left(\delta_g - \sum_k^K \delta_k P_{ik} \right) \left[\frac{(P_m \delta_g - \sum_k^K \delta_k P_{ik})}{P_m (\delta_g - \sum_k^K \delta_k P_{ik})} + \lambda_m \frac{[1 - P_m] \sum_k^K (\delta_k P_{ik})}{P_m (\delta_g - \sum_k^K \delta_k P_{ik})} \right] \right| \quad (6.11)$$

where g refers to the government party.

These marginal effects point out the extent to which the probability P_{ig} changes when there is a one-unit change in the independent variables.

To evaluate the relative importance of the different motives, the relative marginal effects (RME) are calculated for each voter:

$$RME_i^{NP} = \frac{ME_i^{NP}}{ME_i^{NP} + ME_i^P + ME_i^R} \quad (6.12)$$

$$RME_i^P = \frac{ME_i^P}{ME_i^{NP} + ME_i^P + ME_i^R} \quad (6.13)$$

$$RME_i^R = \frac{ME_i^R}{ME_i^{NP} + ME_i^P + ME_i^R} \quad (6.14)$$

Government Accountability

Based on the RME , a government accountability index (GA) was estimated to verify whether electoral competition encourages governments to develop and implement efficient policies that would increase the welfare of the society. Responsible actions by the government can only take place if people choose more policy and retrospectively oriented.

Therefore, the assumption is that, when voters choose more non-policy oriented, the government has a lack of incentives, which in turn results in low accountability.

$$RME^{NP} = \sum_{i=1}^n RME_i^{NP} \quad (6.15)$$

$$RME^P = \sum_{i=1}^n RME_i^P \quad (6.16)$$

$$RME^R = \sum_{i=1}^n RME_i^R \quad (6.17)$$

$$GA = \frac{RME^P + RME^R}{RME^{NP} + RME^P + RME^R} \quad (6.18)$$

where policy and retrospective *RME* can be added up in order to compare policy vs. non-policy motives.

Government Capture

There is government capture when more consideration is given to the political interests of a minority group at the expense of the majority. This implies that a small group of people has comparatively greater insights on political events. In this sense, we assume that the more policy oriented a voter chooses, the more importance he has for political parties. Therefore, to look at the extent to which a group is more important to the governmental party than the other, we first calculate the individual relative political weights:

$$g_i = \frac{ME_i^P}{\sum_{i=1}^n ME_i^P} \quad (6.19)$$

Then, to identify which group from the electorate has a greater weight in the political process, we developed the following government capture index (*GC*):

$$GC_{1vs2} = \frac{\sum_{i \in 1} g_i}{\frac{a_1}{\sum_{i \in 2} g_i} a_2} \quad (6.20)$$

where a_1 and a_2 are the share of voters in group 1 and 2 respectively.

6.3.3. Nash Equilibrium

We intended to identify the equilibrium policy positions where the party in power has no incentive to move away from. Since we were estimating a logit model where the error terms were assumed to be Type I extreme value distributed, a Local Nash Equilibrium (LNE) could be found (Schofield, 2007). In this sense, based on the approach of Petri and Henning (forthcoming), to find the point where the probability P_{ig} is maximized, the following FOC was derived:

$$\frac{\partial P_{ig}}{\partial y_{igd}} = \frac{\partial P_{ig}}{\partial D_{igd}} \frac{\partial D_{igd}}{\partial y_{igd}} \quad (6.21)$$

$$\frac{\partial P_{ig}}{\partial y_{igd}} = P_{ig}(1 - P_{ig})\beta_d \left[\frac{(1 - P_{ig|m})}{(1 - P_{ig})} + \lambda_m \frac{(P_{ig|m} - P_{ig})}{(1 - P_{ig})} \right] 2(y_{igd} - x_{id}) \quad (6.22)$$

where the absolute political weight g_{igd} of voter i for the governmental party g for the issue d is:

$$g_{igd} = P_{ig}(1 - P_{ig})\beta_d \left[\frac{(1 - P_{ig|m})}{(1 - P_{ig})} + \lambda_m \frac{(P_{ig|m} - P_{ig})}{(1 - P_{ig})} \right] \quad (6.23)$$

FOC for all voters:

$$\sum_{i=1}^n \frac{\partial P_{ig}}{\partial y_{igd}} = 0 \quad (6.24)$$

$$\sum_{i=1}^n g_{igd} 2(y_{igd} - x_{id}) = 0 \quad (6.25)$$

$$\sum_{i=1}^n g_{igd}(y_{gd}^* - x_{id}) = 0 \quad (6.26)$$

$$\sum_{i=1}^n g_{igd} y_{gd}^* = \sum_{i=1}^n g_{igd} x_{id} \quad (6.27)$$

$$y_{gd}^* = \sum_{i=1}^n \left[x_{id} \left[\frac{g_{igd}}{\sum g_{igd}} \right] \right] \quad (6.28)$$

where y_{gd}^* is the optimal political position for the governmental party g for the issue d and $\frac{g_{igd}}{\sum g_{igd}}$ is the relative political weight of voter i for the governmental party g for the issue d .

The FOC $\frac{\partial P_{igd}}{\partial y_{igd}} = 0$ was satisfied, where the probability that the governmental party wins the election is maximized.

After we found a Nash-Equilibrium, we confirmed whether the SOC was fulfilled, i.e. the Hessian matrix was negative semi-definite. In our study, this was true, which means that a LNE was estimated. The SOC was derived as follows:

if $d \neq p$, then

$$\begin{aligned} \frac{\partial P_{ig}^2}{\partial^2 y_{igd} y_{igp}} &= \sum [4\beta_d \beta_p (y_{igd} - x_{id})(y_{igp} - x_{ip}) P_{ig}] \quad (6.29) \\ &[(\lambda_m - 1)(P_{ig|m})(1 - P_{ig|m}) + (\lambda_m(P_{ig|m} - 2P_{ig}) + (1 - P_{ig|m})) \\ &((1 - P_{ig|m}) + \lambda_m(P_{ig|m} - P_{ig}))]] \end{aligned}$$

if $d = p$, then

$$\begin{aligned} \frac{\partial P_{ig}^2}{\partial^2 y_{igd} y_{igd}} &= \sum [4(y_{igd} - x_{id})^2 \beta_d^2 P_{ig} [(\lambda_m - 1)P_{ig|m} \\ &(1 - P_{ig|m}) + (\lambda_m(P_{ig|m} - 2P_{ig}) + (1 - P_{ig|m})) \\ &((1 - P_{ig|m}) + \lambda_m(P_{ig|m} - P_{ig}))]] + P_{ig} \beta_d^2 \quad (6.30) \\ &((1 - P_{ig|m}) + \lambda_m(P_{ig|m} - P_{ig}))] \end{aligned}$$

6.4. Data

In the case of Senegal, we designed a voter survey including questions on socio-demographic characteristics, voting behavior, policy positions and network characteristics. It was carried out on January 2019, just before the presidential elections, by the Senegalese Agricultural Research Institute. The interviews were conducted face-to-face in the respective dialect or language of the interviewees. The sample contains 1000 individuals from five different regions across the country. After data cleaning, 844 complete observations remained for the analysis of voters' behavior.

For Honduras, two sources of data were collected:

- Baseline household survey: as part of a food security project developed by the Government of Honduras and IFPRI (International Food Policy Research Institute), detailed data regarding the socio-economic and demographic characteristics of the households was collected in seven departments of Honduras.
- Voter survey: we designed a questionnaire to look at beliefs and political preferences of households. The data was collected through face-to-face interviews conducted in Spanish by O&M Estudios y Proyectos. The survey was carried out just before the general elections on November 2017 in four different departments.

The total sample size of the surveys is 1021 voters. However, after data cleaning, 811 complete observations were available to analyze voting behavior.

6.4.1. Dependent Variable

In a probabilistic voter model the dependent variable is usually the actual or intended vote choice. Nevertheless, given the approach of the nested multinomial logit model for this paper, the alternative Abstention was added. In the questionnaire, respondents were asked:

If a presidential election were held tomorrow, which party's candidate would you vote for?

The respondents showing an intended vote choice for the ruling party were considered to be part of the "Government" nest. On the other hand, the interviewees who did not

show support for the incumbent party were considered members of the “Non-Government” nest. More specifically, within the latter are the voters who chose one of the opposition parties, as well as, those who decided not to participate in the electoral process. As pointed by Thurner and Eymann (2000), the number of people who revealed their intention of abstaining in an election is usually underestimated in surveys due to effects of social (un)desirability. Therefore, following the aforementioned approach we have considered the interviewees who answered “Don’t know” and “Will not vote” as part of the Abstention alternative.

Table 6.1 shows the results of the survey carried out in Senegal, as well as, the official presidential election outcome. Even though the survey results are not very close to the actual election outcome, the party in power BBY (Benno Bokk Yaakaar) is a clear winner in both scenarios. For the analysis in the empirical section we consider all parties and Abstention. Then, the whole set of alternatives is: $K = \{BBY, Rewmi, Pastef, PUR, Niang \text{ and } Abstention\}$.

Table 6.1.: Senegalese presidential elections results

	BBY	Rewmi	Pastef	PUR	Niang	Abstention
<i>Presidential elections 2019</i>	38.48%	13.55%	10.35%	2.69%	0.98%	33.95%
<i>Own survey 2019</i>	70.46%	3.72%	5.30%	1.13%	0.34%	19.05%

Source: (Constitutional Council of Senegal, 2019), own survey

As for Honduras, the results are displayed in table 6.2. Once again, the data provided by the Honduran survey does not resemble the election outcome. However, it confirms that the incumbent party PNH (Partido Nacional de Honduras) was the winner. For the empirical analysis, we took into account the two main parties PNH and PLH, the coalition party Libre + PINU-SD, as well as, the alternative Abstention.

Table 6.2.: Honduran presidential elections results

	PNH	PLH	Libre + PINU-SD	Others	Abstention
<i>Presidential elections 2017</i>	24.10%	8.27%	23.23%	0.50%	43.90%
<i>Own survey 2017</i>	59.10%	19.90%	7.20%	0.00%	13.80%

Source: (Tribunal Supremo Electoral Honduras, 2017), own survey

It is worth noting that in general, people tend to lie when they are asked about their intended vote choice. According to Bannon (2003), only a small percentage of the electorate identify themselves as “non-voters”. Furthermore, he argues that even if all identified as “don’t knows” do not vote, this still does not represent the actual percentage of the electorate who actually abstains.

6.4.2. Independent Variables

The independent variables were divided into policy, retrospective and non-policy variables.

Policy Variables: Seven different policy issues were considered. The policy positions on these issues were asked based on a five-point scale. The interviewees had to indicate their own policy position, as well as, their perceived positions of the parties on the following issues:

1. 1-Agree with liberal policies, 5-Disagree with liberal policies (Social)
2. 1-Left (socialism), 5-Right (capitalism) (Ideology)
3. 1-Tax revenues should be used to provide public services, 5-Tax revenues should be used to further improve economic growth (PSvsEG)
4. 1-Public services expenditures should be mainly invested in improving education and health services, 5-Public services expenditures should be rather used to reduce insecurity and violence (EHvsIV)
5. 1-Economic growth shall be achieved through the development of the agricultural sector, 5-Economic growth shall be achieved through the development of the industrial sector (AGRvsIND)
6. 1-Increase productivity of food crops to guarantee food security, 5-Increase productivity of cash crops to guarantee greater farm income (FoodvsCash)
7. 1-Benefit the agricultural sector through technological progress, 5-Benefit the agricultural sector through better access to markets (TPvsAM)

These were used to calculate distances for parties as the difference between the voters’ own policy position and the perceived policy position of the parties. For the alternative

Abstention, the minimal negative distance was considered. Therefore, the utility of non-voting is greater than the utility of voting and hence the voting paradox is fulfilled.

Retrospective Variables: In the survey, questions of satisfaction with government performance were asked. More specifically, there were questions addressing the level of satisfaction of the interviewees with the performance of the current president, as well as, the implementation of agricultural policies by the government.

Non-policy Variables: A whole set of sociodemographic variables such as gender, age, marital status and education was included. Furthermore, to measure party loyalty, the variable Party ID was used. In particular, alternative specific dummies were created, where "1" indicates party affiliation for that specific party and "0" otherwise. In the case of the alternative Abstention, the variable was set to "0" since there is no such thing as party identification for Abstention. In addition, a set of questions was incorporated asking about the importance of the characteristics of the candidate, as well as, the trust in state institutions and media.

To estimate the nested multinomial logit model where we combined the party/candidate choice with the abstention/participation choice, we created the dummy Abstention, which is equal to "1" if the person decided not to vote and "0" otherwise.

6.5. Empirical Application and Results

6.5.1. Nested Multinomial Logit Model

Using the same variables, we estimated nested multinomial logit models (NML) to observe the factors that influence voting behavior, as well as, those that drive people's decision of abstaining in both countries, Senegal and Honduras. With the data previously described and to demonstrate robust statistics, we performed different model specifications including only the independent variables that, according to the p-value test, were significant. The goodness of fit was defined by means of the Log-likelihood function and, in this paper, only the best models are presented. Additionally, for each country, the corresponding ruling parties were taken as the reference alternative, meaning that the alternative specific coefficients are interpreted in comparison to them. Finally, to confirm that the independent

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variables were not highly correlated with one or more of the other independent variables, a test for multicollinearity was performed. This consisted in calculating the condition indices and variance decomposition proportions to check the intercorrelation among the independent variables. In our optimal models, we found no presence of multicollinearity.

Table 6.3.: Nested Multinomial Logit Model Senegal

Variables	Coefficients	Standard Error	z-value	Pr(> z)	
Abstention:(intercept)	1.9671	0.9328	2.11	0.0350	*
Niang:(intercept)	-2.5489	20.6903	-0.12	0.9020	
Pastef:(intercept)	0.0804	1.1284	0.07	0.9432	
PUR:(intercept)	-0.3482	1.9651	-0.18	0.8594	
Rewmi:(intercept)	-0.2172	1.2012	-0.18	0.8565	
PSvsEG	-0.1374	0.0490	-2.80	0.0051	**
FoodvsCash	-0.0924	0.0526	-1.76	0.0789	.
Party_id	5.7989	0.6713	8.64	0.0000	***
Abstention:Satisfaction_president	-0.5719	0.2571	-2.22	0.0261	*
Niang:Satisfaction_president	-0.6346	6.8514	-0.09	0.9262	
Pastef:Satisfaction_president	-1.0428	0.4728	-2.21	0.0274	*
PUR:Satisfaction_president	-0.6536	1.3598	-0.48	0.6308	
Rewmi:Satisfaction_president	-0.8308	0.3125	-2.66	0.0078	**
Abstention:Trust_president	-0.4775	0.2437	-1.96	0.0501	.
Niang:Trust_president	-0.4377	7.1427	-0.06	0.9511	
Pastef:Trust_president	-0.7249	0.4278	-1.69	0.0902	.
PUR:Trust_president	-0.4615	1.0950	-0.42	0.6734	
Rewmi:Trust_president	-0.8861	0.3701	-2.39	0.0167	*
Abstention:Possibility_winning_elections	-0.0319	0.1032	-0.31	0.7573	
Niang:Possibility_winning_elections	0.2757	6.6716	0.04	0.9670	
Pastef:Possibility_winning_elections	0.7503	0.2639	2.84	0.0045	**
PUR:Possibility_winning_elections	-0.0962	0.4097	-0.23	0.8143	
Rewmi:Possibility_winning_elections	0.6648	0.2520	2.64	0.0083	**
iv:government	0.3086	0.0589	5.24	0.0000	***
iv:non_government	0.9253	0.3345	2.77	0.0057	**

Significant coefficients: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, . $p < 0.10$

Log-Likelihood: -461

McFadden R^2 : 0.383

Likelihood ratio test : $\chi^2 = 574$ ($p.value \leq 2e-16$)

Source: Own estimation

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Table 6.4.: Nested Multinomial Logit Model Honduras

Variables	Coefficients	Standard Error	z-value	Pr(> z)	
Abstention:(intercept)	9.2130	2.6446	3.48	0.0005	***
Libre_PINU_SD:(intercept)	7.9609	2.7136	2.93	0.0034	**
PLH:(intercept)	5.2531	2.5916	2.03	0.0427	*
PSvsEG	-0.1171	0.0296	-3.96	0.0001	***
FoodvsCash	-0.0519	0.0282	-1.84	0.0653	.
Party_id	3.8115	0.3220	11.84	0.0000	***
Abstention:Satisfaction_president	-0.8393	0.3480	-2.41	0.0159	*
Libre_PINU_SD:Satisfaction_president	-1.0468	0.3746	-2.79	0.0052	**
PLH:Satisfaction_president	-0.6207	0.3729	-1.66	0.0960	.
Abstention:Trust_president	-0.8395	0.3419	-2.46	0.0141	*
Libre_PINU_SD:Trust_president	-0.9427	0.3737	-2.52	0.0117	*
PLH:Trust_president	-1.0896	0.3557	-3.06	0.0022	**
Abstention:Possibility_winning_elections	-1.3798	0.4435	-3.11	0.0019	**
Libre_PINU_SD:Possibility_winning_elections	-1.0589	0.5079	-2.08	0.0371	*
PLH:Possibility_winning_elections	-0.3204	0.4768	-0.67	0.5017	.
iv:government	0.9345	0.1088	8.59	0.0000	***
iv:non_government	0.9588	0.2317	4.14	0.0000	***

*Significant coefficients: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, . $p < 0.10$*

Log-Likelihood: -354

McFadden R^2 : 0.598

Likelihood ratio test : $\chi^2 = 1050$ ($p.value \leq 2e-16$)

Source: Own estimation

Tables 6.3 and 6.4 show the optimal nested multinomial logit model estimations for Senegal and Honduras. In both models the significant alternative specific constants or intercepts, that absorb all information not explicitly included in the models, are positive. Further, two political issues (Public Services vs. Economic Growth and Food Crops vs. Cash Crops) resulted significant when voters make their decision. In both cases, the coefficients show the theoretically expected negative sign indicating, in the case of the political parties, that the greater the distance between a voter's position and the perceived position of a party, the less is the utility and thus the less is the probability to vote for that party's candidate. On the other hand, for the alternative Abstention, as the variable has also a negative sign, the greater the distance between a voter's position and the perceived position of the nearest party, the higher is the utility and thus the higher is the probability to abstain. Furthermore, the last significant attribute in our models was Party Identification (PI) with positive coefficients. This implies that, when a voter has party

affiliation for a specific party, he will clearly be very likely to support such party.

It is also interesting to note that the variables Satisfaction with President and Trust President resulted significant for both countries. The negative sign of the coefficients imply that the higher the level of satisfaction/trust from voters, the lower is the probability to either abstain or vote for an opposition party, compared to the ruling parties. Concerning the perception of voters about the winning possibilities of a party/candidate, the more important this characteristic is for voters in Senegal, the higher is the probability of voting for the opposition parties Pastef and Rewmi with respect to BBY. On the contrary, for voters in Honduras, the more important these characteristics of the parties/candidates are, the lower is the probability that they will abstain or choose the opposition coalition in comparison with PNH.

The nests in the models were: Government, if the voter supported the incumbent party and Non-Government, if the voter decided to either abstain or choose an opposition party. Furthermore, the significant lambda values (λ) are the nest elasticities (iv:government and iv:non_government). The correlation values ($1 - \lambda$) within the Government nest were 0.6914 and 0.0655 for Senegal and Honduras respectively, and within the Non_Government nest were 0.0747 and 0.0412.

Finally, with the optimal models we estimated the utilities and probabilities. Tables 6.5 and 6.6 show the mean probabilities for each alternative and country. For both models the government party is the one with the highest probability of winning the elections.

Table 6.5.: Mean probabilities Senegal

Alternatives	Mean Probabilities
<i>Abstention</i>	18.14%
<i>BBY</i>	71.80%
<i>Niang</i>	0.35%
<i>Pastef</i>	4.97%
<i>PUR</i>	1.06%
<i>Rewmi</i>	3.67%

Source: Own estimation

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Table 6.6.: Mean probabilities Honduras

Alternatives	Mean Probabilities
<i>Abstention</i>	13.57%
<i>PNH</i>	59.56%
<i>PLH</i>	19.97%
<i>Libre + PINU-SD</i>	6.91%

Source: Own estimation

In table 6.7 we can see the groups of voters with higher tendency to abstain. More precisely, young, as well as, employed people have a greater probability of abstaining in both countries. Also, in Senegal, women, non-married, non-farmers and educated voters, have lower incentives to cast a vote. Similarly, in most cases, people who less often obtain relevant political and economic information tend to abstain more. Here we could think that less informed voters are less motivated to participate in electoral processes. This, in turn, supports the findings of Feddersen and Pesendorfer (1999), who mentioned that the level of information of the electorate is also determinant regarding the level of participation. In their research, they showed that more informed voters are more likely to vote than their less informed counterparts.

Table 6.7.: Probability to abstain

	Senegal			Honduras		
	mean	mean	p-value	mean	mean	p-value
<i>Men vs Women</i>	16.46%	19.75%	0.0030	13.47%	13.89%	0.8100
<i>Young vs Old</i>	19.09%	16.73%	0.0330	16.03%	12.48%	0.0350
<i>Married vs Other</i>	17.22%	21.67%	0.0029	14.42%	12.97%	0.3300
<i>Employed vs Unemployed</i>	18.25%	14.14%	0.0920	13.86%	7.83%	0.0038
<i>Farmer vs NonFarmer</i>	17.43%	19.59%	0.0700	13.43%	13.70%	0.8500
<i>Educated vs Uneducated</i>	24.00%	17.75%	0.0310	13.81%	13.55%	0.9300
<i>Media (More_Inf vs Less_Inf)</i>	17.08%	20.86%	0.0024	12.57%	19.58%	0.0060
<i>Social Media (More_Inf vs Less_Inf)</i>	22.02%	17.75%	0.0620	12.16%	13.64%	0.6200
<i>Cellphone (More_Inf vs Less_Inf)</i>	16.19%	18.75%	0.0640	10.96%	13.82%	0.1600
<i>Friends and Family (More_Inf vs Less_Inf)</i>	17.31%	22.06%	0.0011	12.58%	16.12%	0.0460
<i>Word of Mouth (More_Inf vs Less_Inf)</i>	17.48%	20.43%	0.0250	13.36%	13.89%	0.7300
<i>Meetings (More_Inf vs Less_Inf)</i>	17.12%	20.10%	0.0082	12.14%	15.28%	0.0340

Source: Own estimation

6.5.2. Government Performance Indicators

The coefficients estimated with the nested multinomial logit model allowed us to measure the direction of the impact. However, to evaluate the magnitude of such impact, marginal effects had to be calculated. Furthermore, in order to assess the importance of each voting component, the next step was to obtain the relative marginal effects (*RME*). The estimation of the *RME*, allows to see how sensitive voters are to changes in each voting motive. Unsurprisingly, as displayed in tables 6.8 and 6.9 all voters choose, in general, more non-policy oriented. However, it is worth noting that, in both countries, non-voters tend to choose more policy and non-policy oriented than those who voted for BBY and PNH respectively. Additionally, those who decided not to support the government parties choose more retrospectively oriented.

Table 6.8.: Relative Marginal Effects Senegal

	Government			Government	Non-Government	
	Party	Abstention	p-value	Party	Party	p-value
<i>Policy</i>	2.20%	3.30%	0.0000	2.20%	1.45%	0.0000
<i>Retrospective</i>	22.22%	6.26%	0.0000	22.22%	29.16%	0.0000
<i>Non-Policy</i>	75.58%	90.44%	0.0000	75.58%	69.39%	0.0000

Source: Own estimation

Table 6.9.: Relative Marginal Effects Honduras

	Government			Government	Non-Government	
	Party	Abstention	p-value	Party	Party	p-value
<i>Policy</i>	2.39%	3.03%	0.0000	2.39%	1.49%	0.0000
<i>Retrospective</i>	12.66%	6.36%	0.0000	12.66%	19.61%	0.0000
<i>Non-Policy</i>	84.94%	90.61%	0.0000	84.94%	78.89%	0.0000

Source: Own estimation

Governments act accountable when they implement policies serving the needs and desires of voters rather than favoring special interests of lobbying groups or intrinsic policy preferences of politicians. This is achieved when voters make their decision more policy and retrospectively oriented. Accordingly, we estimated accountability indices for both countries and the results in table 6.10 indicate that, although in general, the electorate does not hold the governments accountable, non-government supporters have a higher ac-

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countability index. Therefore, this group of people hold the government more accountable, meaning that, if the governments fail to achieve the goals that they committed to, these voters are more likely to abstain or choose an opposition party in order to punish the bad performance.

Table 6.10.: Accountability indices

	Government Party	Abstention	Non-Government Party
<i>Senegal</i>	24.42%	9.56%	30.61%
<i>Honduras</i>	15.06%	9.39%	21.11%

Source: Own estimation

Nevertheless, the government in its quest to be reelected might still have incentives to please the interests of special groups at the expense of the majority of voters. This problem of underrepresentation known as capture is common in electoral processes. To measure the political weight of certain groups of voters, different government capture indices were calculated. In table 6.11 it is evident that, in most cases, the groups of voters with a higher probability to abstain (see table 6.7) capture their counterparts. In addition, it is important to highlight that both, in Senegal and in Honduras, abstainers and non-government voters capture those who decided to support the incumbent parties. This implies, that they have a higher political weight and they could put pressure on the governments to choose and implement better policies, if they decided to vote for the latter. On the other side, BBY and PNH would prefer that these groups do not participate in the electoral process due to their higher political weights.

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Table 6.11.: Capture indices

	Senegal	Honduras
<i>Men vs Women</i>	0.8666	1.0494
<i>Young vs Old</i>	1.0584	1.2421
<i>Married vs Other</i>	0.8935	0.9526
<i>Employed vs Unemployed</i>	1.0711	1.0797
<i>Farmer vs NonFarmer</i>	0.9194	1.0132
<i>Educated vs Uneducated</i>	1.0675	0.9881
<i>Media (More_Inf vs Less_Inf)</i>	0.8389	0.9584
<i>Social Media (More_Inf vs Less_Inf)</i>	1.0619	0.8362
<i>Cellphone (More_Inf vs Less_Inf)</i>	0.8032	0.9708
<i>Friends and Family (More_Inf vs Less_Inf)</i>	0.7926	1.0508
<i>Word of Mouth (More_Inf vs Less_Inf)</i>	0.8441	1.1296
<i>Meetings (More_Inf vs Less_Inf)</i>	0.7930	1.0343
<i>Government Party vs Abstention</i>	0.6480	0.4976
<i>Government Party vs Non-Government Party</i>	0.7514	0.7334

Source: Own estimation

The analysis of the policy component is very important in our research study. Nevertheless, our results have already demonstrated that voters in Senegal and Honduras, choose more non-policy oriented. In this sense, the most relevant non-policy variable in our models was Party Identification. People who abstain usually do not have any party affiliation. On the contrary, people who take part in the electoral process and have PI mostly choose the party towards they have PI. In the case of Senegal, more than 50% of the people who said that would vote, do not have PI. Also, voters tend to lie about their intended vote choice. Therefore, based on the results of our survey compared to the official election outcome (see table 6.1), we might presume that most people without party affiliation did not choose BBY, but instead they decided to abstain or vote for an opposition party. On the other hand, in the case of Honduras, approximately 80% of the voters have party affiliation. However, the actual election results show that more than 40% of the people did not cast a vote (see table 6.2). This supports the findings of Bannon (2003)

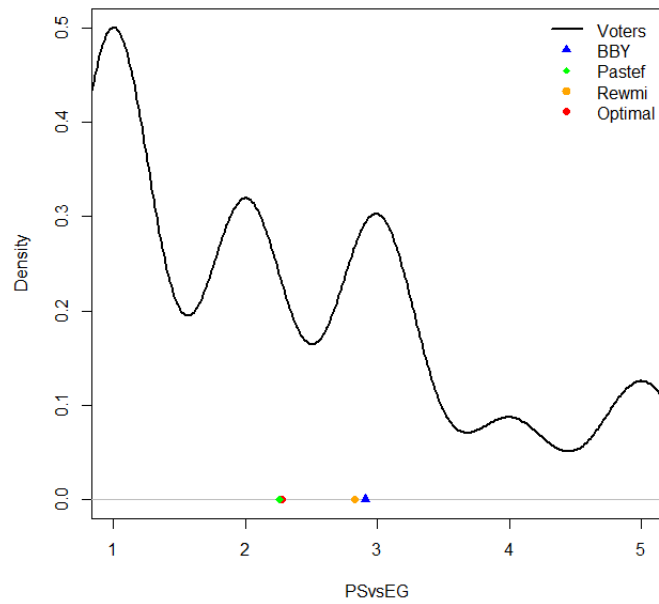
who stated that having a political preference does not necessarily indicate someone's vote choice, because even voters with a political preference might refrain from voting.

6.6. Nash Equilibrium

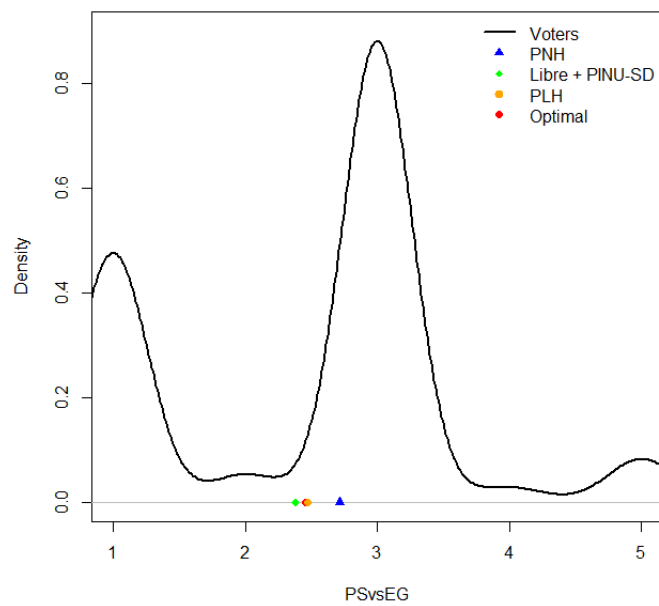
The last stage in our research study was to derive a FOC and a SOC to identify the optimal policy positions (Local Nash Equilibrium) for the issues PSvsEG and FoodvsCash. At these positions, the ruling parties have no incentives to move away from because their probabilities of winning the elections are maximized. In the following Kernel distributions 6.1 and 6.2 the optimal policy positions on each issue are displayed, along with the mean perceived policy positions of the main parties and the positions of all voters.

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Figure 6.1.: Policy Positions for PSvsEG



(a) Senegal

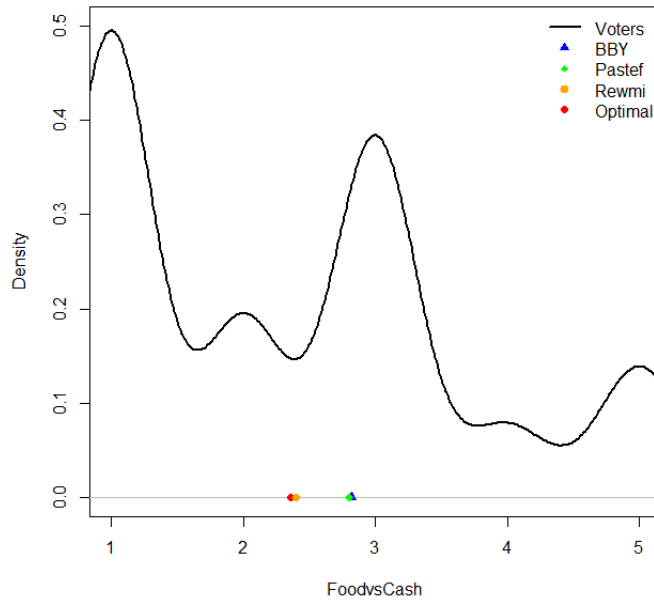


(b) Honduras

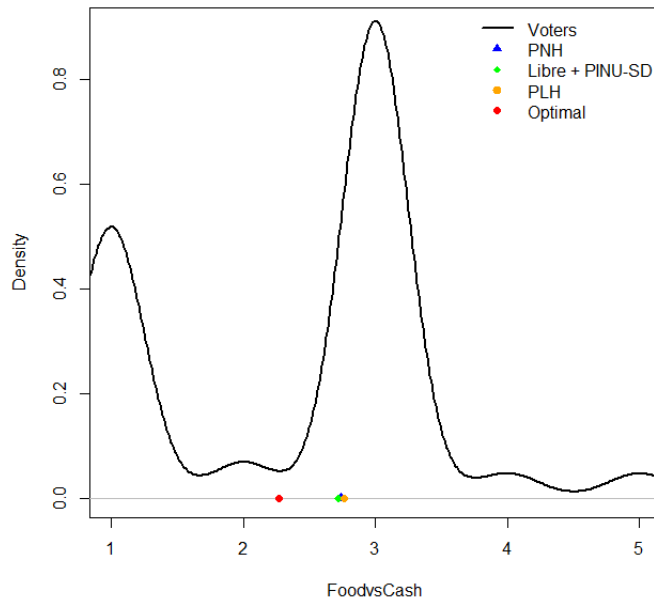
Source: Own estimation

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Figure 6.2.: Policy Positions for FoodvsCash



(a) Senegal



(b) Honduras

Source: Own estimation

For the incumbent parties BBY and PNH to be on their optimal policy positions for each issue, they have to move to the left in both cases. In other words, regarding the issue PSvsEG, the parties should design and implement policies where tax revenues are mainly

used to provide public services like health, education or security, rather than promoting economic growth. Likewise, concerning the issue FoodvsCash, the ruling parties should promote more policies looking to guarantee food security, instead of securing a greater farm income. Should the parties in power move to the optimal positions, they would increase their probabilities of winning the elections by approximately one percentage point.

On the other hand, it is interesting to highlight the fact that, for Senegal, the main opposition parties are perceived to be closer to the optimal policy position than BBY for both issues. In Honduras, the main opposition parties are closer to the optimal policy position than PNH, but only for the issue PSvsEG. For the issue FoodvsCash, all parties are equally distant from the optimal point. In both countries, this might be an advantage for the opposition parties as they could increase their probabilities of winning the elections, if abstainers decided to participate in the electoral processes.

6.7. Summary and Conclusions

In order to compare the importance of abstention in presidential elections between Africa and Latin America, data from Senegal and Honduras was analyzed. In both countries, the majority of the population is engaged in agricultural activities. Also, they face problems of corruption and high poverty levels. Both are presidential republics and have relatively stable democracies with multi-party systems. However, they have experienced a decline in the voter turnout over the past elections, which means that the party systems are somehow failing to engage voters in recent years.

In this study we evaluate the factors that influence voting behavior in Senegal and Honduras, as well as, those factors that influence people's decision of abstaining. More specifically, we assess the importance of non-voters in the policy making processes of these countries, to determine if they could motivate the governments to implement efficient policies. For this purpose we estimated nested multinomial logit models including the alternative Abstention in the choice set.

Our results suggest that, for both countries, policy issues, party identification, a variable related to the level of trust that voters have on the incumbent, their level of satisfaction with the performance of the president, as well as, their perception about the winning possibilities of a candidate/party are important when making an electoral decision. The estimations point at the ruling party of each country as the winner. We also found that, overall, voters with higher tendency to abstain are mostly young and employed people.

Similarly, less informed voters are less motivated to participate in electoral processes. Additionally, in Senegal, women, non-married, non-farmers and educated voters, have lower incentives to cast a vote.

The evidence shows that most people have a tendency to make their decision more non-policy oriented. However, it is worth noting that non-voters tend to choose more policy and non-policy oriented than those who voted for BBY and PNH respectively. In addition, those who decided not to support the government parties choose more retrospectively oriented than their counterparts. Further, despite the fact that the accountability indices are quite low in both cases, those who do not support the incumbent hold the government more accountable. Therefore, if governments fail to achieve the goals that they committed to, these voters are more likely to abstain or choose an opposition party to punish the bad performance. Moreover, abstainers and non-government voters capture those who decided to support the incumbent parties. This implies, that they have a higher political weight and they could put pressure on the governments to choose and implement better policies, if they decided to vote for the latter. On the other side, BBY and PNH would prefer these groups not to participate in the electoral process due to their high political weights.

Regarding the non-policy component, the most relevant variable in our models was Party Identification. People who abstain usually do not have any party affiliation. In the case of Senegal, more than 50% of the people who said that would vote, do not have PI. Therefore, since voters tend to lie about their intended vote choice, we might presume that most people without party affiliation did not choose BBY, but instead they decided to abstain or vote for an opposition party. On the other hand, in the case of Honduras, approximately 80% of the voters have party affiliation. However, the actual election results show that more than 40% of the people did not cast a vote. This suggests that even voters with a political preference might refrain from voting.

The next stage in our study was to identify the optimal policy positions (Local Nash Equilibrium) for the policy issues, where the governments maximize their probability of winning and have no incentives to move away from. Here, we observed that the main opposition parties are perceived to be closer to the optimal policy positions than the parties in power for both issues in the case of Senegal and for the issue PSvsEG in the case of Honduras. This might be an advantage for the opposition parties as they could increase their probabilities of winning the elections, if abstainers decided to participate in the electoral processes.

In conclusion, we can no longer affirm that people decide to abstain just because the act of voting is inconvenient and time-consuming, or that they decide to cast a vote because it is merely a civic duty. In these two developing countries, there are other factors that voters take into account when they decide to either vote or abstain, like their level of satisfaction with the performance of the president. Moreover, we found that less informed voters seem to be less motivated to cast a vote. In addition, the incumbent is held more accountable when all non-government supporters are considered. This means that they are important for the political process and, therefore should be taken into account. Furthermore, since in both countries, the incumbents' voters are being captured by all other groups within the electorate, we could conclude that abstainers, as well as, those who have chosen an opposition party/candidate can motivate the incumbent to choose the policies that better match the specific country needs in order to reduce poverty and undernutrition and promote economic growth. We could also say that, voters in Senegal and Honduras behave similarly and seem to punish the bad performance of the government, not only by voting for an opposition party, but also by abstaining. Finally, our findings suggest that BBY and PNH could increase their probabilities of being re-elected, if they choose policies that are more left oriented.

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7. Chapter

Conclusions

The aim of this research study was to evaluate the role of non-voters in the electoral processes of three developing countries in Africa and Latin America, namely, Uganda, Senegal and Honduras. We were looking to assess, in these countries, the factors that influence both, voting behavior and the decision to abstain. Furthermore, we intended to measure the impact of the voting motives on the performance of the government, as well as, their influence on the policy making process. To carry out the analysis, we used voter survey data containing questions on socio-demographic characteristics, voter behavior and policy positions. The countries under study share some similarities, their population is mainly engaged in agricultural activities, they face problems of corruption, as well as, high levels of poverty and undernutrition. Additionally, these countries have democratic systems that have experienced a decline in the voter turnout over the past elections.

A considerable amount of research have been devoted to the study of voting behavior and government performance. However, the inclusion of abstainers in the analysis has not been widely used. In this sense, the main contribution of this work, and looking to expand the existing knowledge on voter study, was the inclusion of the alternative Abstention in the analysis. Another innovative aspect of this research was the design and implementation of a political experiment. It consisted in the delivery of an information signal about the performance of the incumbent, to observe changes in voter behavior that could influence government performance. As regards the methodology, we derived theoretical models to estimate voter behavior including different voting motives. More specifically, we estimated latent class models, as well as nested multinomial logit models.

We concluded that one of the factors considered by voters when deciding to either vote or abstain, is their level of satisfaction with the performance of the president. It is also worth noting that, the less informed people seem to be less motivated to cast a vote. In addition, in all countries under study, the non-policy component is the most relevant, implying that the governments are not accountable towards voters and elections are not

an effective mechanism to promote democracy. Nonetheless, some minority groups choose more policy oriented, which means that they could exercise more influence in the policy making process. Further, although in general, accountability indices are quite low, we observed that, those who do not support the incumbent hold the government more accountable. Thus, if governments fail to achieve the goals that they committed to, these voters are more likely to abstain or choose an opposition party to punish the bad performance. Moreover, abstainers and non-government voters have a higher political weight than those who decided to support the incumbent parties. This implies, that they could put pressure on the governments to choose and implement better policies, if they decided to vote for the latter. We also demonstrated that, voter behavior can be influenced or even changed by means of information signals. Although the impact on party choice was not very strong, the relative importance of the three voting components changed significantly. Finally, the opposition parties are perceived to be closer to the optimal policy positions, which gives an incentive to the ruling parties to change their policy positions. Nevertheless, according to our results, if most of abstainers decided to cast a vote, the final electoral outcome could change in favor of opposition parties.

7.1. The Importance of Policy vs. Non-Policy Voting in Presidential Elections in Uganda: A Latent Class Approach

Voters apply different mechanisms to evaluate candidates or parties. Some base their decision on the announced policy platforms, while others choose based on non-policy factors, such as, the characteristics of the candidate and electoral campaign. In consequence, the higher the importance of non-policy oriented versus policy oriented voter behavior, the lower is the incentive of a government, seeking for reelection, to implement policies that benefit its electorate. Additionally, it is worth mentioning the considerable percentage of abstention registered in the electoral processes carried out in the short history of Uganda's democracy. Therefore, the contribution of this research study is the inclusion, in the choice set, of the alternative Abstention for assessing the importance of policy and non-policy voting components.

To this end, we derived a theoretical model to estimate voter behavior including both voting motives, policy and non-policy oriented. More specifically, since not all voters act homogeneously, we estimated latent class models to allow heterogeneity. Our findings

indicate that the non-policy component is the most relevant and, in general, voters and non-voters tend to decide more non-policy oriented. The low indices of accountability suggest that the government might implement inefficient policies that privilege the interests of lobbying groups at the expense of the interests of the whole society. Nonetheless, it is important to highlight that those who do not support the ruling party NRM have a higher accountability index than the NRM supporters. In addition, Non-NRM voters have more political weight than NRM voters, thus, they should be considered in the policy-making process as they might incentive the government to implement efficient policies to reduce poverty and undernutrition in the country.

Finally, we conclude that, the political process in Uganda is biased. The fact that the non-policy component is more relevant than the policy component, implies that the government is not accountable towards the voters and elections are not an effective mechanism to promote democracy. This could explain why the current president has been ruling the country for over 30 years, which is a very a long time even for African standards. However, as our results suggest, if most of the people who abstain decided to cast a vote, the final electoral outcome could change in favor of the opposition party FDC.

7.2. Do Ethnicity and Gender Influence Government Performance in Uganda?: Empirical Estimations with Latent Class Models

Inequality issues in Uganda, entail aspects of identity such as gender and ethnicity. Women and minor ethnic groups are usually relegated or even denied political rights, access to education, adequate health care and land rights. In this study, we were looking to determine the influence of gender and ethnicity variables on voting behavior and its impact on government performance in Uganda. In other words, the purpose of this research was to find out if commonly marginalized groups could exert influence on the policy making process.

We tested our theory estimating probabilistic voter models including Abstention as an alternative. Furthermore, with the latent class analysis we identified two classes of voters based on their gender and ethnic background. Our results suggest that women in general choose more non-policy oriented. However, when looking at their education level, it is worth noting that educated women choose more policy oriented than the uneducated. As regards the ethnicities, we found that the Lugbara tribe, has a higher accountability index compared to other ethnic groups. Nevertheless, the Musoga ethnicity has a higher political

weight.

In conclusion, if the level of education of women in Uganda increases, they might incentive the government to apply better policies. On the other hand, the Lugbara tribe chooses more policy oriented, which implies that it exerts more control over the incumbent than other tribes. In addition, the Musoga ethnicity captures the other ethnic groups, therefore, it could exercise more influence in the policy making process.

7.3. Changes in Voter Behavior after an Information Signal: An Experimental Approach for Senegal

Electoral competition is considered a control mechanism, as voters have the power to either punish the bad performance of the government or reward the good one through their vote. In this sense, the analysis of voter behavior is a key factor to understand government performance. More specifically, if voters choose more policy and retrospectively oriented, the government has greater incentives to implement efficient policies. Thus, the contribution of this research study was to demonstrate that when voters have more information on politics, they are more likely to base their decision on policy issues.

In this regard, we performed a random experiment to deliver information to a group of voters in Senegal prior to the presidential election. The experiment comprised a series of videos containing information about the performance of the government in the agricultural sector. Then, with the data collected from the experimental study, we proceeded to estimate probabilistic voter models with latent class to measure the changes in voter behavior and government performance. According to our results, the information signal did change the behavior of voters. However, the impact on party choice was not very strong. On the other hand, after the information signal, the relative importance of the three voting components changed significantly. Even though, we expected that the more informed voters are, the more policy oriented they would choose, in most cases, the importance of the non-policy voting motive increased, resulting in lower government accountability indices. This suggests that the electorate in Senegal do not hold accountable the government.

In conclusion, voter behavior can be influenced or changed by means of information signals, as it was demonstrated with our political experiment. In this regard, the sample size is crucial to observe a clear treatment effect.

7.4. Voting vs. Non-Voting in Senegal: A Nested Multinomial Logit Model Approach

Elections are deemed a vital principle of democracy and a way to ensure that efficient policies are implemented by the government. The political participation is a constitutional right and some people consider the act of voting as a citizen's civic responsibility. However, it is clear that not all people take part in electoral processes. In this sense, Senegal, even though is considered an example of a stable democracy, has experienced a decline in the voter turnout over the past elections. The main goal of this study was to assess influencing factors both, in voting behavior in Senegal and in the decision to abstain.

For this purpose, we estimated nested multinomial logit models including the alternative Abstention to determine the importance of the non-voters group in the policy making process. Our findings suggest that, even though people in general make their decision more non-policy oriented, abstainers tend to choose more retrospectively oriented compared to those who decided to participate in the elections. Furthermore, this group of non-voters hold the government more accountable and have a higher political weight for the incumbent party. We also observed that abstainers usually do not feel close to any party. In the last stage of our study, we identified the optimal policy positions (Local Nash Equilibrium) for the policy issues, where the government maximizes its probability of winning and has no incentives to move away from. We observed that the main opposition parties are perceived to be closer to the optimal policy positions than the incumbent.

We conclude that abstainers could hold the government more accountable. Furthermore, they capture people who cast a vote, which means that, from a perspective looking to the Senegalese society's welfare, they could incentive the government to choose and implement more efficient policies if they decided to participate in the elections. An interesting point to be highlighted is that abstainers usually do not have Party Identification (*PI*). Therefore, we might assume that most people with no *PI* who said that would vote for BBY, actually decided to abstain or vote for an opposition party. Thus, should the main opposition parties form a coalition, their probability of winning the elections is higher, as long as, abstainers decided to vote. Finally, the fact that the opposition parties are perceived to be closer to the optimal policy positions, indicates that policy oriented voters might decide to choose an opposition party. This in turn, gives an incentive to the government party to change its policy positions.

7.5. How Important Are Abstainers in Presidential Elections?: A Comparative Analysis between Africa and Latin America

In democratic systems, electoral competition should guarantee the implementation of efficient policies. However, even in countries with well functioning democracies, not all people with the right to vote in a presidential election decide to cast a vote. The aim of this research was to compare the importance of abstention in presidential elections in Africa and Latin America. For this purpose we used data from Senegal and Honduras. These countries have relatively stable democracies and multi-party systems. They share some similarities, as the majority of their population is engaged in agricultural activities, and they face problems of corruption and high levels of poverty. Furthermore, in both countries the level of abstention has increased over the past elections.

To assess the importance of non-voters in the policy making processes, we estimated nested multinomial logit models with the inclusion of the alternative Abstention. Our empirical evidence shows that overall, voters with higher tendency to abstain are mostly young, employed and the less informed. Also, most people make their decision more non-policy oriented. However, non-voters tend to choose more policy and non-policy oriented than government supporters of each country. Moreover, the non-government supporters, choose more retrospectively oriented and, in both cases, hold the incumbent more accountable. It is worth noting that non-government voters and abstainers, capture the incumbent supporters. Concerning the optimal policy positions, we observed that the main opposition parties are perceived to be closer to such positions than the parties in power.

We concluded that, in these two developing countries, one of the factors that voters take into account when they decide to either vote or abstain, is their level of satisfaction with the performance of the president. Also, the less informed people seem to be less motivated to cast a vote. Furthermore, the incumbent is held more accountable when all non-government supporters are considered. Moreover, since in both countries, the incumbents' voters are being captured by all other groups within the electorate, we could argue that abstainers, as well as, those who have chosen an opposition party/candidate can motivate the incumbent to choose the policies that better match the specific country needs in order to reduce poverty and undernutrition and promote economic growth. We could also say that, voters in Senegal and Honduras behave similarly and seem to punish

the bad performance of the government, not only by voting for an opposition party, but also by abstaining. Finally, we found that the ruling parties of each country could increase their probabilities of re-election, if they choose policies more left oriented.

8. Chapter

Zusammenfassung

8.1. The Importance of Policy vs. Non-Policy Voting in Presidential Elections in Uganda: A Latent Class Approach

In demokratischen Systemen sollen Wahlen die Interessen der gesamten Gesellschaft wiedergeben und dazu dienen die Regierung zu kontrollieren. In der Realität führen Wahlkämpfe auf Grund von *Government Capture* und geringer *Government Accountability* jedoch zu Politikversagen. Um ein Verständnis für die genannten Phänomene zu erlangen, muss Bezug auf Wählertheorien sowie probabilistische Wählermodelle, die heutzutage als "Workhorse Models" gelten, genommen werden. Es gibt bereits Ansätze, die die Analyse von Wählerverhalten und politischer Performanz untersuchen (Keefer and Khemani (2005) und Bardhan and Mookherjee (2002)). Hingegen argumentieren andere Studien, wie von Downs (1957) und Grossman and Helpman (1996), dass Wähler bestimmte Mechanismen verwenden, um Wahlkandidaten oder Parteien zu bewerten. Bezugnehmend auf das Untersuchungsland, zeigen die Ergebnisse von Seide (2014), dass das Wahlverhalten in Uganda vorherrschend von nicht politik-orientierten Motiven angetrieben ist. Um dem hohen Anteil der Nichtwähler in der kurzen Historie von Ugandas Demokratie mit einbezieht, wurde die Alternative "Stimmenenthaltung" in das *Choice Set* in die vorliegende Arbeit integriert. Hierdurch soll die Wichtigkeit der Motive für das *wählen* und *nicht-wählen* im Entscheidungsprozess der Wähler bewertet werden.

Zur Durchführung der Analyse wurden Daten einer Wählerbefragung genutzt, die sozioökonomische Charakteristika, Wahlverhalten sowie Politikpositionen abfragten und von Seide (2014) erhoben wurden. Des Weiteren wurde ein theoretisches Modell entwickelt, um das Wahlverhalten sowie die zwei Wahlmotive, politik- und nicht politik-orientiertes Wählen, zu schätzen. Anschließend wurde ein Latent-class Modell geschätzt, um Heterogenität zu berücksichtigen und marginale- sowie relative marginale Effekte (RME) berechnet, um die Wichtigkeit der einzelnen Wahlmotive zu bestimmen. Außerdem wurden Indikatoren zur *Government Performance* geschätzt.

Die Ergebnisse zeigen die Einteilung in zwei Wählerklassen: Die erste Klasse vertritt hierbei überwiegend Randgruppen, wohingegen die zweite Klasse das jeweilige Gegenstück repräsentiert. Im Bezug auf die geschätzten durchschnittlichen Wahrscheinlichkeiten zeigt sich, dass die regierende Partei NRM mit erheblichem Abstand als Siegespartei hervorgeht. Die RME zeigen, dass die nicht politik-orientierte Komponente als am wichtigsten gewertet wird. Die geschätzten Indikatoren der Government Performance geben an, dass die Politik in Uganda durch Verzerrungen geprägt ist. Die Regierung verhält sich gegenüber den Wählern nicht verantwortlich und der Wahlvorgang dient nicht als ein effektives Mittel zur Sicherstellung demokratischer Strukturen. Im Vergleich haben nicht-NRM Unterstützer einen höheren Accountability-Index, als die Unterstützer der Regierungspartei. Des Weiteren verfügt diese Gruppe über höhere politische Gewichte und captured die Gruppe der Regierungsunterstützer. Daher sollte sie in Politikbildungsprozesse einbezogen werden, da sie Einfluss auf die effektive Gestaltung von Regierungsaktivitäten nehmen kann. Abschließend ist festzuhalten, dass mit einer höheren Wahlbeteiligung durch Nichtwähler die Wahrscheinlichkeit für eine Regierungsablösung durch die FDC steigt.

8.2. Do Ethnicity and Gender Influence Government Performance in Uganda?: Empirical Estimations with Latent Class Models

Das Konzept der Ungleichheit beruht oftmals auf Unterschieden des Einkommens, es umfasst aber auch Identitätsausprägungen, wie die ethnische Herkunft oder das Geschlecht. In Uganda stellen Frauen und ethnische Minderheiten eine benachteiligte Gruppe im Bezug auf gute Bildungschancen, hoch vergütete Anstellungen und Landrechte dar. Eine Vielzahl von Wissenschaftlern wie Atekyereza (2001), Kasirye and Kasirye (2011) und Pedersen et al. (2012) haben die Diskriminierung von Frauen in Uganda bereits thematisiert. Andererseits behandeln nur wenige Abhandlungen die Ausgrenzung ethnischer Minderheiten, zum Beispiel Moradi and Baten (2005). Des Weiteren behandeln die Arbeiten von Tripp (1994), Singiza and Visser (2015) und Wordofa (2004) die Bedeutung von Benachteiligung im politischen Kontext. Obwohl ein kompetitiver Wahlkampf für eine hohe *Government Performance* sorgen soll, führt er jedoch oft nur zu Politikversagen, wenn Wähler bei der Wahlentscheidung nicht politik-orientiert handeln. Im Falle der angesprochenen benachteiligten Gruppen in Uganda werden solche Handlungen durch den beschränkte Zugang zu Bildung verstärkt. Daher besteht für die Regierung kein Anreiz die Wähler in

politische Entscheidungen mit einzubeziehen und effiziente Politiken zu implementieren. Die verwendeten Daten entstammen einer von Seide (2014) durchgeführten Befragung und umfassen sozioökonomische Charakteristika, Angaben zum Wahlverhalten sowie Politikpositionen. In dieser Studie wurden latente Klassenmodelle geschätzt, wobei die Alternative der Wahlenthaltung berücksichtigt ist, um herauszufinden, ob im Zusammenhang mit der ethnischen Herkunft und dem Geschlecht Einfluss auf das Wahlverhalten in Uganda genommen wird. Um die Wichtigkeit der einzelnen Komponenten des Wählens zu bestimmen, wurden marginale Effekte sowie relative marginale Effekte (RME) berechnet. Des Weiteren wurden Capture- und Accountability-Indices berechnet, um mögliche fehlende Anreizstrukturen zur Bereitstellung effizienter und unverzerrte Politiken zu entwickeln und bereitzustellen aufzudecken. Mit Hilfe der latenten Klassenanalyse wurden zwei Klassen, basierend auf Geschlecht und ethnischem Hintergrund, identifiziert. Die Ergebnisse zeigen, dass die regierende Partei NRM als Wahlsieger hervorgeht. Im Bezug auf die RME stellt sich heraus, dass Frauen stärker nicht politik-orientiert wählen als Männer. Betrachtet man jedoch das Bildungsniveau ist zu unterstreichen, dass gebildete Frauen eher politik-orientiert handeln. Würde das Bildungsniveau von Frauen in Uganda steigen, so besteht gegebenenfalls ein Anreiz für die Regierung effizientere Politiken zu implementieren. Außerdem kann die ethnische Gruppe der Lugbara, obwohl sie nicht die am stärksten vertretene Gruppe ist, die politischen Amtsinhaber dazu bewegen effizientere Politiken bereitzustellen, da sie stark politik-orientiert wählt. Jedoch captured die ethnische Gruppe der Musoga die Gruppe Lugbara auf Grund höherer politischer Gewichte und übt daher stärkeren politischen Einfluss auf den politischen Prozess aus.

8.3. Changes in Voter Behavior after an Information Signal: An Experimental Approach for Senegal

In der politischen Theorie werden Wahlkampfaktivitäten als ein Kontrollmechanismus verstanden, bei dem der Wähler durch seine Stimmenabgabe die Möglichkeit hat schlechte Regierungstätigkeiten zu bestrafen oder gute zu belohnen. In der Realität führen Wahlen jedoch auf Grund von *Government Capture* und *Government Accountability* oft zu verzerrten Politikimplementierungen. Wie auch Grossman and Helpman (1996) bestätigen, hängen Wahlmotive vom Informationsstand der Wähler im Hinblick auf bestimmte Politiken ab. Andere Autoren, wie Coate (2004) und Banerjee et al. (2011) bekräftigen die

Wichtigkeit von Informationen, wenn es um Wahlentscheidungen geht.

In dieser Arbeit wurde ein politisches Experiment durchgeführt, bei dem Informationssignale an verschiedene Wählergruppen weitergeleitet wurden. Basierend auf Umfragedaten, die vor und nach der Signalaussendung erhoben wurden, wurden Veränderungen im Wahlverhalten untersucht. Hierfür wurde auf probabilistische Wählermodelle eine latente Klassenanalyse angewendet. Des Weiteren lag der Fokus auf der Veränderung der relativen Wichtigkeit der drei Wahlmotive (politisches, nicht politisches und retrospektives Wählen).

Mit den optimalen Modellen wurden die Wahrscheinlichkeiten für jede Alternative, jede Art der Behandlung und jede Runde berechnet. Obwohl es Veränderungen zwischen den Runden gab, war der Einfluss der Parteienwahl nicht sehr stark. Wie erwartet, änderte sich nach dem Informationssignal die relative Bedeutung der drei Wahlkomponenten signifikant. Obwohl wir erwartet hatten, dass die Wähler umso politikorientierter wählen würden, je besser sie informiert sind, nahm in den meisten Fällen die Bedeutung des nichtpolitischen Wahlmotivs zu, was zu niedrigeren *Government Accountability indices* der Regierung führte. Unsere Ergebnisse legen nahe, dass das Verhalten der Wähler durch den Einsatz von Informationssignalen beeinflusst oder verändert werden kann. Da jedoch kein eindeutiger Treatment-Effekt beobachtet wurde, sind weitere Untersuchungen mit einer größeren Stichprobe erforderlich.

8.4. Voting vs. Non-Voting in Senegal: A Nested Multinomial Logit Model Approach

Wahlen stellen einen interaktiven Baustein demokratischer Systeme dar, da sie effiziente Politikimplementierungen der Regierung sicherstellen sollen. Jedoch werden häufig ineffiziente Politiken von der Regierung auf Grund mangelnder *Government Performance* eingeführt. Außerdem beteiligen sich nicht alle berechtigten Gesellschaftsmitglieder an Wahlen, obwohl eine Wahlbeteiligung ein konstitutionelles Recht darstellt. Die Aufmerksamkeit ist in der Forschung, zum Beispiel von Downs (1957), Bailey (1999) und Bardhan and Mookherjee (2002) daher auf das Wählerverhalten gerichtet. Jedoch wurde der Einfluss des nicht-Wählens bisher selten in die Untersuchungen einbezogen. Die Forschung von Thurner and Eymann (2000) leistet hierbei einen ersten Beitrag, indem sie ein räumliches Modell zur Kandidaten-/Parteienwahl mit der Entscheidung an der Wahl teilzunehmen

oder sich zu Enthalten kombiniert. Im Bezug auf geringe Forschungsaktivitäten in diesem Bereich, soll in der vorliegenden Arbeit die Rolle von Wahlenthaltungen auf den Politikbildungsprozess im Senegal untersucht werden.

Zum Zweck dieser Studie wurde eine Wählerbefragung entwickelt, die vor der Präsidentschaftswahl 2019 im Senegal durchgeführt wurde. Um gleichermaßen das Wahlverhalten sowie den Einfluss von Wahlenthaltungen zu berücksichtigen wurde ein genestetes multinomiales Logit-Modell geschätzt, das die Entscheidung zur nicht-Wahl beinhaltet. Außerdem wurden marginale Effekte und relative marginale Effekte (RME) für sämtliche Wahlmotive geschätzt, um die Performanz der Regierung zu bewerten. Um herauszufinden, ob ein Wahlkampf der Regierungspartei Anreize verschafft effizient zu regieren, wurden zusätzlich Capture und Accountability Indices geschätzt. Durch die Ableitung von Bedingungen erster und zweiter Ordnung (FOC und SOC) soll die politische Gleichgewichtsposition identifiziert werden, welche der regierenden Partei die Anreize nimmt ihre vorherrschende Politikposition zu verändern.

Die Ergebnisse zeigen, dass unterschiedliche politik-, nicht politik- und retrospektive Variablen entscheidend für das Wahlverhalten der Wähler sind. Die Schätzungen zeigen außerdem, dass die Gewinnwahrscheinlichkeit am höchsten für die Regierungspartei BYY ist und dass die meisten Wähler ihre Entscheidung auf nicht politik-orientierte Motive stützen. Jedoch handelt die Gruppe der Nichtwähler, im Vergleich zur aktiv teilnehmenden Gruppe, verstärkt retrospektiv motiviert. Dies impliziert, dass die erstgenannte Gruppe einen höheren Accountability Index hat und daher die Regierungspartei stärker in die Verantwortung zieht. Außerdem hat die sich enthaltende Gruppe höhere politische Gewichte im Hinblick auf die Regierungsparteien und captured daher die Wählergruppe. Für die senegalesische gesellschaftliche Wohlfahrt bedeutet dies, dass die Gruppe in der Lage ist mit ihrem Wahlverhalten Anreize für die Regierung zu schaffen effizientere Politiken bereitzustellen, würden sie an der Wahl teilnehmen. Im Bezug auf die nicht politik-orientierten Motive lässt sich feststellen, dass sich Nichtwähler nicht zu einer bestimmten Partei hingezogen fühlen. Außerdem hat ein großer Anteil der Wähler keine Parteiidentifikation (PI). Allgemein neigen die Befragten dazu im Bezug auf ihre Wahlmotive zu lügen. Daher wird vermutet, dass diejenigen, die angeben über keine PI zu verfügen und für die BYY zu stimmen, sich in Wahrheit eher für die Opposition zu entscheiden oder der Wahl fernzubleiben. Daher ist es möglich, dass die Oppositionspartei durch eine Koalitionsbildung ihre Siegeschancen erhöht, sofern Nichtwähler sich entscheiden an der Wahl teilzunehmen. Abschließend ist

festzuhalten, dass die geschätzten FOC und SOC darauf hinweisen, dass sich die Oppositionspartei näher an der optimalen Politikposition befindet als die Regierungspartei. Dies gibt einen Anreiz für die amtierende Regierung ihre Position zu verändern, da politikorientierte Wähler sonst eher der Opposition zugeneigt sind.

8.5. How Important Are Abstainers in Presidential Elections?: A Comparative Analysis between Africa and Latin America

Um Armut und Unterernährung in einem Land zu verringern und ökonomisches Wachstum zu erzielen ist die Qualität der Regierungsführung ausschlaggebend. Ein Wahlkampf mit Wettbewerbscharakter sollte den regierenden Amtsinhaber zu einer guten Regierungsperformance anregen. Doch selbst in Ländern mit etablierten demokratischen Systemen entscheiden sich nicht alle wahlberechtigten Bürger an der Wahl teilzunehmen. Auch wenn die Wählerschaft auf globaler Ebene wächst und die Anzahl der Länder, die Wahlen abhalten gestiegen ist, sank die durchschnittliche Wahlbeteiligung laut Solijonov (2016) in den vergangenen Jahrzehnten. Diese Tendenz lässt sich auf den Senegal und Honduras übertragen, wo die Wahlbeteiligung in den letzten Jahren ebenfalls sank. Demzufolge ist das Ziel dieser Analyse die Bedeutung von Wahlenthaltungen im Politikbildungsprozess in Afrika und Lateinamerika zu untersuchen.

Hierfür wurden detaillierte Daten erhoben, welche sozioökonomische Charakteristika, Beliefs und Politikpräferenzen von Haushalten im Senegal und in Honduras umfassen. Des Weiteren wurde ein genestetes multinomiales Logit-Modell geschätzt, das die Möglichkeit der Wahlenthaltung berücksichtigt. Zur Bewertung der *Government Performance* wurden Indikatoren der *Accountability* und *Capture* abgeleitet. Außerdem wurden Bedingungen erster und zweiter Ordnung (FOC und SOC) für verschiedene Dimensionen geschätzt, um die optimale Politikposition für Regierungsparteien zu bestimmen.

Die Schätzungen weisen auf den Wahlsieg der amtierenden Regierungspartei hin. Des Weiteren lassen sich die Nichtwähler als junge, über eine feste Anstellung verfügende Menschen charakterisieren. Außerdem haben weniger informierte Personen weniger Motive an der Wahl teilzunehmen. Die Ergebnisse beweisen, dass die Wahlentscheidung in der Regel auf nicht politik-orientierten Motiven beruht. Jedoch ist zu betonen, dass die Nichtwähler eher dazu geneigt sind politik- und nicht politik-orientiert zu entscheiden, als jene Wähler, die für die Regierungspartei stimmen. Auch wenn die *Accountability Indices* in beiden

Ländern sehr gering ausfallen, zieht die Gruppe, die die Regierungspartei nicht unterstützt diese stärker in die Verantwortung. Des Weiteren capturen die Nichtwähler und Unterstützer der Opposition die Wähler der Regierungspartei. Fortführend wurde in der vorliegenden Studie untersucht, wo sich die optimale Politikposition befindet, welche die Wahlwahrscheinlichkeit der Regierungspartei maximiert. Es konnte herausgestellt werden, dass sich die Opposition in der Regel näher an der Optimalposition befindet, als die Regierungspartei. Dies kann zum Vorteil von Oppositionsparteien werden, wenn Nichtwähler sich dazu entschließen an der Wahl teilzunehmen. Zusammenfassend ist festzuhalten, dass in diesen zwei Entwicklungsländern die Zufriedenheit mit der Performanz des Präsidenten ein ausschlaggebender Faktor ist, wenn es um die Entscheidung geht, ob an einer Wahl teilgenommen wird oder nicht. Es ist zu betonen, dass Nichtwähler sowie Oppositionswähler der amtierende Regierung Anreize verschaffen können Politiken stärker nach den Bedürfnissen des Landes auszurichten, um Armut und Unterernährung zu reduzieren und wirtschaftliches Wachstum zu fördern.

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A. Methodology

A.1. Voter Behavior

A.1.1. Rational Choice Approach

There have been several approaches to explain voter behavior. The theory of rational voting (Downs, 1957) was among the first to combine voter behavior and government behavior. This theory assumes that voters gain utility from implemented policies. Therefore, they will vote for the candidate/party whose policies provide them with the highest expected utility. Correspondingly, political parties seek to choose the policy position that maximizes their expected vote share. However, as Thurner and Eymann (2000) pointed out, the aspects of abstention/participation have been neglected even though it is clear that not all voters decide to cast a vote in electoral processes. Therefore, in order to also analyze the voters' decision to refrain from participating, the whole set of alternatives must include the option Abstention.

In this sense, if voter behavior is modeled taking into account the rational choice approach, researchers differentiate between a deterministic and a probabilistic voter model. In the deterministic voter model, the probability that voter i chooses alternative A is calculated as follows:

$$P_{iA}(A, B) = 1 \text{ if } V_{iA} > V_{iB} \tag{A.1}$$

$$P_{iA}(A, B) = 0,5 \text{ if } V_{iA} = V_{iB} \tag{A.2}$$

$$P_{iA}(A, B) = 0 \text{ if } V_{iA} < V_{iB} \tag{A.3}$$

where V_{iA} and V_{iB} are the utilities that voter i associates with alternatives A and B respectively. In other words, the voting decision depends on the alternative differential $V_{iA} - V_{iB}$. In empirical research, however, it is not possible to observe and control all the factors involved in the voting decision process. Therefore, it is more suitable to estimate a probabilistic voter model that makes possible the inclusion, in the utility function, of an individual-specific stochastic component μ_{ik} containing these unknown factors.

$$P_{iA}(A, B) = Prob(U_{iA} \geq U_{iB}) \text{ where } U_{ik} = V_{ik} + \mu_{ik}, k = A, B \tag{A.4}$$

A.1.2. Discrete Choice Models

Probabilistic voter models are estimated with Discrete Choice models, since they explain choices between two or more alternatives. More specifically, these models answer to the questions: who?, what? and how?. Hence, in the context of voter behavior, discrete choice models are exceptionally suitable, as researchers are more interested in the way results were achieved rather than the actual results. Furthermore, in an election, the set of alternatives satisfies all three requirements, i.e. voters choose a party unless they decide to abstain (collectively exhaustive), each voter is allowed to choose only one party/candidate or to abstain (mutually exclusive) and there is only a finite number of alternatives (all parties and abstention).

In order to derive the Discrete Choice model, it is common to apply a Random Utility Maximization (RUM) Model. Here, if the voter i decides to participate in the election, he chooses alternative k only if this alternative provides him the highest utility U_{ik} . In other words, the greater the utility of an alternative, the more likely is that the voter will choose it. Similarly, if the voter chooses not to participate, the greater utility comes from the alternative Abstention.

A.1.3. Multinomial and Conditional Logit Models

As previously mentioned, the utility U_{ik} is divided into the part that is known by the researcher V_{ik} and the random unknown part μ_{ik} . We assume that the latter is independently, identically extreme value distributed (iid) and follow the Gumbel distribution (extreme value distribution Type I), i.e. μ_{iA} is not related to μ_{iB} , and thus a logit model is derived. This model can be extended to a set with multiple alternatives, meaning that voters can choose an alternative k from a set of alternatives K . In this sense, the logit probability model can be derived as McFadden (1974)

$$P_{ik}(K) = \frac{e^{V_{ik}}}{\sum_{k=1}^K e^{V_{ik}}} \quad (\text{A.5})$$

Depending on the kind of variables and parameters that are included, there are different logit models. A multinomial logit model consists of individual specific variables, like age, gender and religion, with alternative specific coefficients. On the other hand, a conditional logit model contains alternative specific variables, such as issue distances, with generic

coefficients. Since this study includes both kinds of variables, a mixture of multinomial logit and conditional logit model is estimated. Furthermore, individual specific variables are different for every voter/alternative combination, whereas alternative specific variables vary across alternatives. A simple form of the model looks as follows:

$$P_{ik}(K) = \frac{e^{V_{ik}}}{\sum_{k=1}^K e^{V_{ik}}} \text{ where } V_{ik} = \alpha_k + \beta x_{ik} + \delta_k r_i \quad (\text{A.6})$$

where α_k is an alternative specific constant, x_{ik} is a vector of alternative specific variables with a generic coefficient β , and r_i is the individual specific variable with an alternative specific coefficient δ_k . When the alternative specific coefficients are estimated with one of them set to zero, the remaining coefficients are interpreted with respect to the alternative whose coefficient was set to zero. On the contrary, generic coefficients are constant for all alternatives.

A.1.4. Probabilistic Voter Model

The logit model estimated in this study includes three components or voting motives: non-policy oriented (V_{ik}^{NP}), policy oriented (V_{ik}^P) and retrospective oriented (V_{ik}^R). The voter's utility function is now as follows:

$$V_{ik} = V_{ik}^{NP} + V_{ik}^P + V_{ik}^R \quad (\text{A.7})$$

Not all voters are well informed and aware of policies, especially in developing countries. Therefore, voters might apply non-policy indicators to estimate their expected utility, such as their socio-demographic characteristics x_{ij} , as well as, their approval of the incumbent's work y_{ig} . Other indicators correspond to the concept of valence (Schofield, 2007), which holds that voters perceive a specific competence or popularity of candidates based on specific characteristics z_i like charisma and appearance. In addition, party identification PI_{ik} works as an intensifier in the favoritism towards a candidate from the preferred political party, and therefore, it has been included in the utility function of the voter by several authors such as Erikson and Romero (1990); Adams (2001) and Adams et al. (2005).

$$V_{ik}^{NP} = \sum_j^J \alpha_{kj} x_{ij} + \alpha_k y_{ig} + \alpha_k z_i + \alpha PI_{ik} \quad (\text{A.8})$$

If voters are well informed and interested in politics, they might decide based on the

policy platforms proposed by the candidates. In this sense, the policy oriented voter's utility function is calculated based on the spatial voting model (Davis et al., 1970; Enelow and Hinich, 1984), as the weighted distance between a voter's position x_{id} on a specific issue d and the perceived position taken by the party or candidate y_{ikd} on the same issue:

$$V_{ik}^P = -\sum_d^D \beta_d (y_{ikd} - x_{id})^2 \text{ where } (y_{ikd} - x_{id}) = D_{ikd} \quad (\text{A.9})$$

Notice that the coefficient β is always negative, because the greater the distance between the voter's position and the party/candidate's position, the less is the utility. For the alternative Abstention, the utility of non-voting is greater than the utility of voting and hence the voting paradox is fulfilled.

As regards the retrospective voting motive (Fiorina, 1981), voters can express a general assessment of the past performance of a party/candidate or the government. In this sense, voters use observable welfare indicators Z_{ir} which are determined by governmental policies (γ_G).

$$V_{ik}^R = \sum_r^R \delta_{kr} Z_{ir} (\gamma_G) \quad (\text{A.10})$$

Note that in the estimation of our model, we assumed that the assessment of the economic performance of the government also has an impact on the voters' evaluation of the opposition parties, as well as, on the decision of refraining from voting.

A.1.5. Latent Class Models

The logit model already described assumes that all voters act homogeneously. However, since we are also interested in analyzing the impact of voter behavior on government performance, more specifically on government accountability and capture, heterogeneity must be allowed as it is a necessary condition for the existence of capture. Therefore, this model needs to be extended to a latent class model. So now the probability that voter i chooses alternative k is class-specific (c).

$$P_{ikc} = \frac{e^{V_{ikc}}}{\sum_{k=1}^K e^{V_{ikc}}} \text{ where } V_{ikc} = V_{ikc}^{NP} + V_{ikc}^P + V_{ikc}^R \quad (\text{A.11})$$

The classes are generated based on the individual socio-demographic characteristics of the voter. We refer to the vector containing these characteristics as covariates. An

iterative process is used to determine class-specific utility functions and the probability of class membership. The optimal model is determined by means of the Akaike Information Criterion (AIC).

In the latent class model the voter has an additional utility v_{ic} if he belongs to a group because of his socio-demographic characteristics x_{ij} and therefore chooses differently from another group.

$$v_{ic} = \alpha_c + \sum_j^J b_{cj}x_{ij} \quad (\text{A.12})$$

where α_c is the class intercept, b_{cj} are the class-specific coefficients and x_{ij} are the individual characteristics of the voters.

Based on this utility v_{ic} , a probability p_{ic} that an individual belongs to a class is calculated:

$$p_{ic} = \frac{e^{v_{ic}}}{\sum_{c=1}^C e^{v_{ic}}} \quad (\text{A.13})$$

Then, to calculate the probability of the classes, one has to weight the probability that voter i chooses alternative k given that he belongs to class c (P_{ikc}) with the probability that voter i actually belongs to class c (p_{ic}):

$$\bar{P}_{ik} = \sum_c^C P_{ikc} * p_{ic} \quad (\text{A.14})$$

To carry out the estimations using a panel data set, it was necessary to make the classes fixed to observe changes between rounds t , that is, classes 1 and 2 correspond to the first round and classes 3 and 4 correspond to the second round. Finally, to calculate the probabilities per round, classes 1 and 2 were added for the first round and correspondingly, classes 3 and 4 were added for the second round.

A.1.6. Nested Multinomial Logit Models

We were looking to assess the importance of abstainers in presidential elections. Therefore, following the approach of Thurner and Eymann (2000) we proposed a model that simultaneously combines the choice among several parties and the alternative abstention. To this end, we combined the probabilistic voter model of party/candidate choice with the participation/abstention choice in a single nested multinomial logit model based on

Croissant (2012) and Greene (2008):

$$P_{ik}(K) = P_{ik|m}P_m \tag{A.15}$$

with

$$P_{ik|m} = \frac{e^{V_{ik}}}{\sum_k e^{V_{ik}}} \text{ where } V_{ik} = \alpha_k + \beta x_{ik} + \delta_k r_i \tag{A.16}$$

and

$$P_m = \frac{\left(\sum_k e^{V_{ik}}\right)^{\lambda_m}}{\sum_m \left(\sum_j e^{V_{ij}}\right)^{\lambda_m}} \tag{A.17}$$

The conditional probability (equation A.16) is the exponential expected utility of voter i from alternative k divided by the sum of the exponential expected utilities of all the alternatives within a nest m . In other words, it is the probability that voter i chooses alternative k that belongs to a nest m . The marginal probability (equation A.17) is the sum of the exponential expected utilities of all the alternatives within a nest to the power of λ_m (elasticity of nest m), divided by the sum of the exponential expected utilities for all nests. Finally, the probability that voter i chooses alternative k (equation A.15) is calculated by multiplying the conditional probability of choosing alternative k if the nest m is chosen times the marginal probability of choosing the nest m . For this model to be compatible with the RUM, all the nest elasticities have to be in the interval from 0 to 1.

A.2. Government Performance

A.2.1. Marginal Effects

Since the probability P_{ik} is logistically distributed, the algebraic signs of the coefficients indicate the direction of the impact, but the absolute values cannot be interpreted. Hence, marginal effects (ME) were calculated, as they show how sensitive are voters to changes in policy, non-policy and retrospective components.

- **Latent Class Models:**

– For the variables with generic coefficients ME were estimated as follows:

$$ME_{ic}^P = \frac{\partial P_{ikc}}{\partial x_{di}} = |2\beta_d (y_{dik} - x_{di}) P_{ikc} (1 - P_{ikc})| \quad (\text{A.18})$$

$$ME_i^P = \sum_c^C ME_{ic}^P * p_{ic} \quad (\text{A.19})$$

– For the variables with alternative specific coefficients ME were estimated as follows:

$$ME_{ic}^{NP} = \frac{\partial P_{ikc}}{\partial y_{ig}} = \left| P_{ikc} \left(\alpha_k - \sum_k^K \alpha_k * P_{ikc} \right) \right| \quad (\text{A.20})$$

$$ME_i^{NP} = \sum_c^C ME_{ic}^{NP} * p_{ic} \quad (\text{A.21})$$

• **Latent Class Models for Panel Data Set:**

– For the variables with generic coefficients ME were estimated as follows:

* For the distances:

$$ME_{ic}^P = \frac{\partial P_{ikc}}{\partial D_{dik}} = P_{ikc} (1 - P_{ikc}) \beta_d \text{ where } D_{dik} = (y_{dik} - x_{di}) \quad (\text{A.22})$$

* For party identification:

$$ME_{ic}^{NP} = \frac{\partial P_{ikc}}{\partial P_{I_{ik}}} = P_{ikc} (1 - P_{ikc}) \alpha \quad (\text{A.23})$$

– For the variables with alternative specific coefficients ME were estimated as follows:

$$ME_{ic}^R = \frac{\partial P_{ikc}}{\partial Z_{ir}(\gamma_G)} = P_{ikc} \left(\delta_{kG} - \sum_{k=1}^K \delta_{kr} P_{ikc} \right) \quad (\text{A.24})$$

Then, the marginal effects for the first round ($t = 1$) comprehend the marginal effects for classes 1 and 2. Likewise, to calculate the marginal effects for the second round ($t = 2$), the marginal effects for classes 3 and 4 were used.

$$ME_{it}^{NP} = \left| \sum_{c=1}^C \left[\left(\sum ME_{ic}^{NP} \right) p_{ic} \right] \right| \quad (\text{A.25})$$

$$ME_{it}^P = \left| \sum_{c=1}^C [(\sum ME_{ic}^P) p_{ic}] \right| \quad (\text{A.26})$$

$$ME_{it}^R = \left| \sum_{c=1}^C [(\sum ME_{ic}^R) p_{ic}] \right| \quad (\text{A.27})$$

• **Nested Multinomial Logit Models:**

– For the variables with generic coefficients ME were estimated as follows:

$$\frac{\partial P_{ig}}{\partial D_{igd}} = \left| P_{ig} (1 - P_{ig}) \beta_d \left[\frac{(1 - P_{ig|m})}{(1 - P_{ig})} + \lambda_m \frac{(P_{ig|m} - P_{ig})}{(1 - P_{ig})} \right] \right| \quad (\text{A.28})$$

– For the variables with alternative specific coefficients ME were estimated as follows:

$$\frac{\partial P_{ig}}{\partial Z_{ir}} = \left| P_{ig} \left(\delta_g - \sum_k^K \delta_k P_{ik} \right) \left[\frac{(P_m \delta_g - \sum_k^K \delta_k P_{ik})}{P_m (\delta_g - \sum_k^K \delta_k P_{ik})} + \lambda_m \frac{[1 - P_m] \sum_k^K (\delta_k P_{ik})}{P_m (\delta_g - \sum_k^K \delta_k P_{ik})} \right] \right| \quad (\text{A.29})$$

where g refers to the government party.

These marginal effects point out the extent to which the probability P_{ik} changes when there is a one unit change in the independent variables.

A.2.2. Relative Marginal Effects

To evaluate the relative importance of the voting motives, the relative marginal effects (RME) were calculated for each voter:

$$RME_i^{NP} = \frac{ME_i^{NP}}{ME_i^{NP} + ME_i^P + ME_i^R} \quad (\text{A.30})$$

$$RME_i^P = \frac{ME_i^P}{ME_i^{NP} + ME_i^P + ME_i^R} \quad (\text{A.31})$$

$$RME_i^R = \frac{ME_i^R}{ME_i^{NP} + ME_i^P + ME_i^R} \quad (\text{A.32})$$

In the case of the panel data set analysis, RME were calculated for both rounds t to assess the changes.

A.2.3. Government Accountability

In democratic systems, the function of accountability implies that electoral processes serve as control mechanisms. Therefore, electoral competition should encourage governments to develop and implement efficient policies that increase the welfare of the society. Responsible actions by the government can only take place if people choose more policy and retrospectively oriented. In this sense, we assumed that government accountability is low when voters choose more non-policy oriented and viceversa. Thus, based on the RME we derived a government accountability index (GA).

$$RME^{NP} = \sum_{i=1}^n RME_i^{NP} \quad (\text{A.33})$$

$$RME^P = \sum_{i=1}^n RME_i^P \quad (\text{A.34})$$

$$RME^R = \sum_{i=1}^n RME_i^R \quad (\text{A.35})$$

$$GA = \frac{RME^P + RME^R}{RME^{NP} + RME^P + RME^R} \quad (\text{A.36})$$

where policy and retrospective RME can be added up in order to compare policy vs. non-policy voting motives.

A.2.4. Government Capture

When governments attend the concerns of special interest groups and fails to act in the public interest, emerges government capture. In other words, the implementation of biased policies is the result of high levels of government capture. Hence, we assumed that the more policy oriented a voter chooses, the more importance he has for parties. Consequently, for

the purpose of determining the government capture index (GC), we first calculated the individual relative political weights:

$$g_i = \frac{ME_i^P}{\sum_{i=1}^n ME_i^P} \quad (\text{A.37})$$

Since voters cannot influence a political process individually, it is interesting to analyze different groups from the electorate to identify those with a greater political weight.

$$GC_{1vs2} = \frac{\frac{\sum_{i \in 1} g_i}{a_1}}{\frac{\sum_{i \in 2} g_i}{a_2}} \quad (\text{A.38})$$

where a_1 and a_2 are the share of voters in group 1 and 2 respectively.

A.3. Nash Equilibrium

We intended to identify the equilibrium policy positions where the party in power has no incentive to move away from. Since we were estimating a logit model where the error terms were assumed to be Type I extreme value distributed, a Local Nash Equilibrium (LNE) could be found (Schofield, 2007). In this sense, based on the approach of Petri and Henning (forthcoming), to find the point where the probability of winning the elections is maximized, the following First Order Condition (FOC) was derived.

- **Latent Class Models for Panel Data Set:**

$$\frac{\partial P_{igt}}{\partial y_{digt}} = \sum_i \sum_c p_{ic} \beta_{dc} P_{igc} (1 - P_{igc}) 2 (y_{dgt}^* - x_{dit}) = 0 \quad (\text{A.39})$$

$$\sum_i \sum_c p_{ic} \beta_{dc} P_{igc} (1 - P_{igc}) y_{dgt}^* = \sum_i \sum_c p_{ic} \beta_{dc} P_{igc} (1 - P_{igc}) x_{dit} \quad (\text{A.40})$$

for simplicity we denote:

$$\sum_c p_{ic} \beta_{dc} P_{igc} (1 - P_{igc}) = \bar{g}_{digt} \quad (\text{A.41})$$

where \bar{g}_{digt} is the absolute political weight of voter i for the governmental party g for the issue d in round t .

$$y_{dgt}^* = \sum_i \left[x_{dit} \left[\frac{\bar{g}_{digt}}{\left(\sum_i \bar{g}_{digt} \right)} \right] \right] \quad (\text{A.42})$$

where y_{dgt}^* is the optimal political position for the governmental party g for the issue d in round t and $\frac{\bar{g}_{digt}}{\left(\sum_i \bar{g}_{digt} \right)}$ is the relative political weight of voter i for the governmental party g for the issue d in round t .

- **Nested Multinomial Logit Models:**

$$\frac{\partial P_{ig}}{\partial y_{igd}} = P_{ig}(1 - P_{ig})\beta_d \left[\frac{(1 - P_{ig|m})}{(1 - P_{ig})} + \lambda_m \frac{(P_{ig|m} - P_{ig})}{(1 - P_{ig})} \right] 2(y_{igd} - x_{id}) \quad (\text{A.43})$$

where the absolute political weight g_{igd} of voter i for the governmental party g for the issue d is:

$$g_{igd} = P_{ig}(1 - P_{ig})\beta_d \left[\frac{(1 - P_{ig|m})}{(1 - P_{ig})} + \lambda_m \frac{(P_{ig|m} - P_{ig})}{(1 - P_{ig})} \right] \quad (\text{A.44})$$

FOC for all voters:

$$\sum_{i=1}^n \frac{\partial P_{ig}}{\partial y_{igd}} = \sum_{i=1}^n g_{igd} 2(y_{igd}^* - x_{id}) = 0 \quad (\text{A.45})$$

$$y_{gd}^* = \sum_{i=1}^n \left[x_{id} \left[\frac{g_{igd}}{\sum g_{igd}} \right] \right] \quad (\text{A.46})$$

where y_{gd}^* is the optimal political position for the governmental party g for the issue d and $\frac{g_{igd}}{\sum g_{igd}}$ is the relative political weight of voter i for the governmental party g for the issue d .

The FOC = 0 was satisfied for every case, meaning that on the optimal policy positions the ruling party maximizes the probability of winning the elections.

The next step, was to confirm if the Second Order Condition (SOC) was satisfied. In this study, the Hessian matrix was for every case negative semi-definite, implying the existence of a LNE. The SOC was derived as follows:

- **Latent Class Models for Panel Data Set:**

$$\frac{\partial^2 P_{igt}}{\partial y_{digt} \partial y_{eigt}} = \sum_i \sum_c p_{ic} P_{igc} (1 - P_{igc}) \left[(1 - 2P_{igc}) \frac{\partial \hat{V}_{igc}}{\partial y_{digt}} \frac{\partial \hat{V}_{igc}}{\partial y_{eigt}} + \frac{\partial^2 \hat{V}_{igc}}{\partial y_{digt} \partial y_{eigt}} \right] \quad (\text{A.47})$$

Thereby, it holds:

$$\sum_i \sum_c \frac{\partial^2 V_{igc}}{\partial y_{digt} \partial y_{eigt}} < 0 \quad \forall i, \forall d = e, \quad \frac{\partial^2 V_{igc}}{\partial y_{digt} \partial y_{eigt}} = 0 \quad \forall i, \forall d \neq e$$

- **Nested Multinomial Logit Models:**

if $d \neq p$, then

$$\begin{aligned} \frac{\partial P_{ig}^2}{\partial^2 y_{igd} y_{igp}} &= \sum [4\beta_d \beta_p (y_{igd} - x_{id})(y_{igp} - x_{ip}) P_{ig}] \quad (\text{A.48}) \\ &[(\lambda_m - 1)(P_{ig|m})(1 - P_{ig|m}) + (\lambda_m(P_{ig|m} - 2P_{ig}) + (1 - P_{ig|m})) \\ &\quad ((1 - P_{ig|m}) + \lambda_m(P_{ig|m} - P_{ig}))] \end{aligned}$$

if $d = p$, then

$$\begin{aligned} \frac{\partial P_{ig}^2}{\partial^2 y_{igd} y_{igd}} &= \sum [4(y_{igd} - x_{id})^2 \beta_d^2 P_{ig} [(\lambda_m - 1)P_{ig|m} \\ &\quad (1 - P_{ig|m}) + (\lambda_m(P_{ig|m} - 2P_{ig}) + (1 - P_{ig|m})) \\ &\quad ((1 - P_{ig|m}) + \lambda_m(P_{ig|m} - P_{ig}))] + P_{ig} \beta_d^2] \quad (\text{A.49}) \\ &\quad ((1 - P_{ig|m}) + \lambda_m(P_{ig|m} - P_{ig}))] \end{aligned}$$

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